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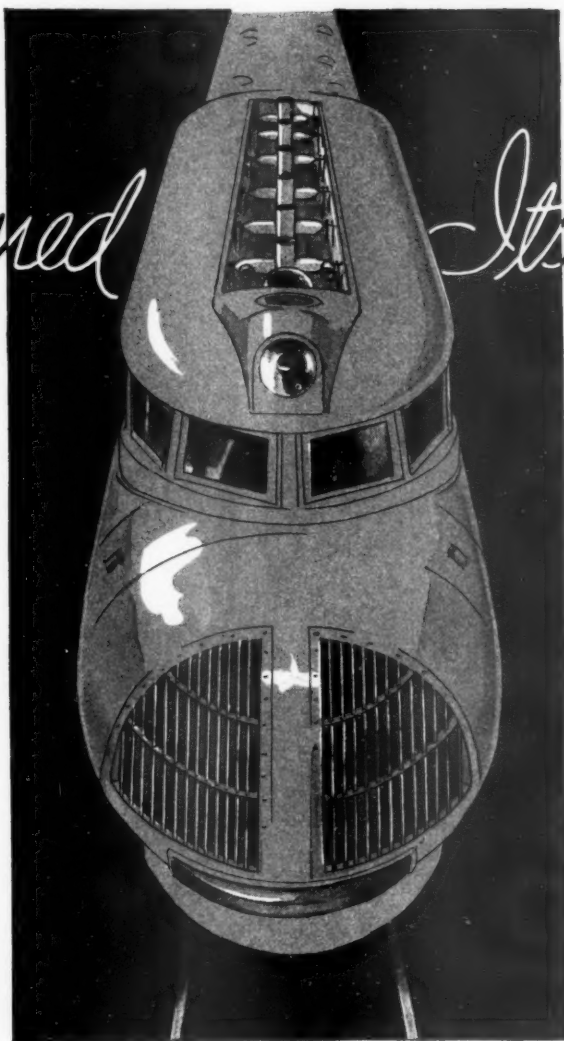
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Pantographs
Parcel Racks
Seats
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Truck Parts
Trolley Poles
Ventilators
Window Sash &
Hardware



Railway Evidence of Economic Revival

Despite the obstacles which "reform-before-recovery" political acts or threats have placed in the way of business revival, recovery forces have thus far proved too strong to be balked, and appear to be gaining in strength. Particularly significant is the announcement made last week by the Wall Street Journal that its index of prices of high-grade legal railway bonds had reached the highest point attained since the Dow-Jones averages were started in 1915. The *Railway Age* index of twenty representative railway bonds (which includes several issues in default) last week stood at 78.33 which, with the exception of two weeks last month, was the highest point it has attained since the middle of 1931, when none of the issues included in the averages were in default. Indeed, high-grade railway bonds are selling at considerably better prices on the average today than they were in 1929, when speculative fever attracted investors into stocks rather than bonds. This trend in the bond market, combined with several relatively small sales of bonds by a leading railroad at prices which would be considered favorable even in normal times, indicates a condition in the capital market most favorable to revival, which can scarcely fail to occur if the government at Washington will permit it to do so.

Earnings Increase

The trend of railway earnings likewise not only evidences revival which has actually occurred, but points toward further improvement in future. Railway operating revenues in the first two months of the present year totaled \$506,442,000 which was an increase of 15 per cent over the first two months last year and only 5 per cent under the total for those months in 1932. Net railway operating income in January this year, which totaled \$30,931,000, was more than twice as great as that earned last year and exceeded that of 1932 even more. Net railway operating income in February exceeded that of February of any of the past three years, and there seem to be good grounds for assuming that that earned in March this year will not be much less than the total for March, 1930. Thus, despite the fact that earnings are still entirely inadequate and unsatisfactory—less than 2 per cent on the property investment in the first two months this year—and despite the fact that present earnings showings would not be possible if accumulated undermaintenance were taken into account—nevertheless the trend is distinctly en-

couraging. There is more satisfaction by a whole lot in being poor and getting less so steadily than there is in being relatively well-to-do and getting constantly poorer with no indication as to when the trend will stop.

What Car Loadings Reveal

It is the general consensus that economic recovery now largely depends upon a revival of the "durable goods" industries, since in them severe unemployment and inactivity still persists. The recent favorable trend of revenue freight car loadings is significant, therefore, not only because of the increase shown in total loadings over those of the first three months of 1933 and 1932, but also because the increases in certain classes of commodities indicate a decided upturn in "durable goods" industries. These commodities are coal, coke, forest products, ore and, to some degree, "miscellaneous" freight. In the first twelve weeks this year, according to the compilation of the Car Service Division of the American Railway Association, coal loadings were 29 per cent greater than in the same period of 1933 and 20 per cent greater than in 1932; coke traffic was higher by 69 per cent than in 1933 and 51 per cent above 1932; forest products surpassed 1933 and 1932 loadings by 50 per cent and 11 per cent respectively; ore traffic was 72 per cent greater than in 1933 and 19 per cent over 1932; and miscellaneous freight loaded in the first twelve weeks of this year was 31 per cent more than in 1933 and 9 per cent above 1932.

Quite evidently, therefore, a revival in the "durable goods" industries is under way in spite of the political reforms which are hampering and menacing it. That it shows such hardihood in the face of these obstacles is encouraging indeed, and gives some indication of the magnitude of revival we might expect if the political reforms could be moderated or postponed. After all, the competent surgeon does not usually perform a major operation on a patient for a chronic malady until he shows some recovery from an acute attack. Similarly, the reformers in Washington ought to postpone their major operations on industry until the poor fellow shows some real vitality. And, as the car loadings figures indicate, he would quickly do that if the reformers would leave him alone temporarily, and, to carry the medical analogy one step further, treat only his acute symptoms.

But while plans proceed apace for major reforms—

control of exchanges, social insurance, higher wages, reduced hours of labor and the like—some really acute industrial disorders are suffered to continue without alleviation. Here again, the cumulative car loading totals are significant in the evidence they afford regarding one of these disorders. With an increase in total car loadings of 21 per cent in the first twelve weeks of the current year over 1933 and 2 per cent over 1932, loadings of l.c.l. freight this year were but $2\frac{1}{2}$ per cent higher than in 1933 and were actually $14\frac{1}{2}$ per cent lower than in 1932. Similarly, live stock loadings in the first twelve weeks of this year were only 1 per cent over last year and were 20 per cent less than in 1932. These are the two classes of freight most subject to the competition of unregulated truck transport for which President Roosevelt prescribed a remedy as long ago as the fall of 1932, long before the NRA and the AAA and other new governmental arrangements of the alphabet had even been heard of. That remedy has yet to be administered; but it is one upon which the opinion of disinterested experts after exhaustive study and analysis is as nearly unanimous, probably, as it ever was on any politico-economic question, namely, regulation of interstate highway transportation by the same body which regulates the railroads. The Interstate Commerce Commission and the Federal Co-ordinator of Transportation have urged immediate action to this end upon Congress and the Administration, but so far without apparent result.

A Railway Renaissance

Aside from the lethargy of the government in tackling resolutely the reforms in transportation legislation which are urgently needed and despite its persistence in general policies toward business which are delaying recovery, nevertheless a revival is occurring and on the railroads in particular this is marked by great alertness on the part of the leaders of the industry, to whom in fact must be given a large part of the credit for the revival which has occurred. Never before in history probably have railway managers and those who supply them with equipment and materials been so receptive to new methods and materials, and awake in a scientific and open-minded attitude toward their problems. The willingness to experiment with passenger fares, the search both by railways and manufacturers for equipment which may revolutionize this branch of the service, the intensive study of motive power economics which appears to promise so much for a further increase in railway efficiency, the efforts being made in every department of the railroad and by all classes of equipment manufacturers to achieve greatly improved efficiency and service by the railroads—all these, and scores of other similar instances may be cited. The studies of fundamental railroad problems being made by Co-ordinator Eastman and his staff in co-operation with the railroads have, of course, done much to stimulate and augment the prevalent spirit of inquiry. If anyone can recall a period in railroad history when there has been a healthy ferment half so great, let him name it.

None of the questions raised has been finally answered, to be sure, but the train of progress is well on its way out of the initial terminal.

Improvement in Passenger Traffic

While the January summary of revenue traffic, just made public by the Interstate Commerce Commission, shows that passenger-miles and passenger revenues in that month were 11 per cent and 28 per cent, respectively, below the 1932 level, comparison of these figures with those of January last year offers further support to the hope that the downward trend of passenger business has at last been definitely reversed.

In January, for the second consecutive month, there was an increase over the corresponding month of the previous year in the number of revenue passengers carried. This is the first time since September and October, 1923—more than ten years ago—that two consecutive months have shown such improvement. Indeed, in the 121 months from October, 1923, to December, 1933, only five widely separated months showed an increase in this respect over the same months of the preceding year.

Furthermore, January marks the eighth consecutive month in which passenger business, measured in passenger-miles, exceeded the same month of the previous year. From May, 1926, to June, 1933, a span of seven years, there were only two months—and those not consecutive—in which passenger-miles were greater than in the year preceding.

Finally, passenger revenues in January, for the fifth time in the last six months, exceeded those of a year ago. Due, however, to the various reductions in passenger fares which have been made effective, the increase in passenger revenues was relatively only about one-seventh as great as the increase in passenger-miles.

Passenger traffic reached its lowest point in March, 1933, when the banking moratorium was effective. In that month, traffic showed a loss of 29 per cent below March, 1932, and, for the first and only time since monthly records are available, fell below a billion passenger-miles. The reversal of the downward trend of passenger traffic is perhaps best indicated by the facts that, as measured by passenger-miles, the first five months of 1933 fell 22 per cent below 1932; the last seven months of 1933 showed an increase of 9 per cent over 1932; and January, 1934, showed an increase of 15 per cent over January, 1933.

Due to the reductions in fares previously mentioned, this increase of 15 per cent in passenger-miles in January was accompanied by an increase of only two per cent in gross passenger revenues. Average revenue per passenger-mile in January, 1934, amounted to but 2.021 cents, a reduction of 11 per cent below January, 1933, and of 32 per cent below January, 1929.

Burlington "Zephyr" Completed at Budd Plant

The first Diesel-propelled articulated train of stainless-steel construction for high-speed service will be introduced to the public next week

A SELF-PROPELLED, three-car, articulated high-speed train of light-weight stainless steel construction has been completed for the Chicago, Burlington & Quincy by the Edward G. Budd Manufacturing Company, Philadelphia, Pa. This train, which is known as the "Zephyr," will receive its first introduction to the public at the Broad Street Station of the Pennsylvania Railroad in that city next week. It will then embark upon a two months' exhibition tour, taking in the principal cities across the continent, and will thereafter spend the summer on exhibition at A Century of Progress Exposition, Chicago. On its return to the home rails it will be placed in service between Kansas City, Mo., Omaha, Nebr., and Lincoln, replacing existing steam service with much faster schedules and, it is anticipated, with a considerable reduction in operating cost.

The train is driven by a Winton 600-hp. Diesel-electric power plant and is designed for speeds of approximately 110 m.p.h. This involved considerations of aerodynamics in shaping the train to reduce the air resistance, both head-end and frictional. Wind-tunnel tests of scale models at the Massachusetts Institute of Technology indicate that at an operating speed of 95 m.p.h. the total resistance to motion will have been reduced to about 47 per cent of that of a train of three coaches of conventional shape, weight being equal.

But in the development of the train attention was not confined to advanced engineering features. The architectural firms of Paul Cret, of Philadelphia, Pa., and Holabird & Root, of Chicago, collaborated in working out the arrangement, ornamentation and decoration of the

Foreword

THE loss of railway passenger traffic during the last decade has been caused by a shifting of travel from the railways to the highway and not from a decline in total travel. In fact, the total passenger one-mile units of travel have greatly increased, but the percentage of the total which has been handled by the railways has been greatly diminished and only twenty per cent as much local traffic by rail was performed in 1933 as in 1920.

Conventional lines have been followed in the design of passenger equipment for a great many years. In departing from convention and undertaking to make improvements that would result in lower train operating costs with added travel comfort, our idea has been to call upon the industry which has taken from us much of our traffic, namely, the automobile industry.

We have accordingly collaborated with the Edward G. Budd Manufacturing Company, the General Motors Corporation and the Massachusetts Institute of Technology, and with two architectural firms, Paul Cret and Holabird & Root. These concerns were given carte blanche in designing and decorating the Zephyr without any restrictions except those which are inherent to railway equipment, namely, the gage of the track and the clearances within which the outside dimensions must be kept.

The railways are very jealous of their record of safety, and stress was laid in our instructions that no compromise be made with safety but that insofar as possible the safety factors must be increased.

In the consideration of material, the character of which must provide the greatest strength with a minimum of weight, it was of paramount importance that we select a material not only uniform in structure, but one entirely non-corrosive to the end that the section which we rely upon and design for may be permanent during the entire service life of the train.

Ralph Budd

passenger accommodations and in the design of the furnishings in order that the train may provide the utmost in comfort and attractiveness to the traveler.

The train consists of three car bodies carried on four trucks. It is 196 ft. in length and it is estimated to weigh 195,000 lb. There are seats for 72 passengers in the second and third cars and space is provided in the first and second cars for 50,000 lb. of baggage and express. The first car also contains a 30-ft. mail compartment. The passenger accommodations are divided among three compartments. At the rear end of the second car is a 16-ft. smoking compartment with seats for 20 persons. At the front of the third car is a 31-ft. compartment with seats for 40 persons, and at the rear of this car is a solarium-lounge with chairs for 12. Side doors and steps are provided for passengers in the two rear cars.

In the second car the entrance is between the smoking compartment and the buffet adjoining the baggage compartment. In the rear car the entrance is at the rear of the main passenger compartment.

The Car Body Structure

In its structure this train is a complete departure from conventional design. To a very large extent the entire body structure from floor to roof performs load-carrying functions. The characteristic truss form of construction adapted by the Budd company for the utilization of built-up sections of thin-gage Shotweld stainless steel is used. The main members of the car bodies are the Pratt truss side frames which have, in effect, been carried up to the roof by the use of diagonals in wide



The Burlington "Zephyr" Is Built of Stainless Steel

deadlights between the windows and of which the roof forms the top chord. The truss members are generally of flanged box sections formed of deep flanged channels and cover plates joined by Shotwelds. The steel of which these sections are formed has a minimum tensile strength of 150,000 lb. per sq. in. and an elastic limit of 120,000 lb. per sq. in., with satisfactory ductility.

One of the illustrations shows a specimen of a section originally 14 in. in length tested to destruction in compression and reduced to a length of $6\frac{3}{4}$ in. without a break in the material. This member, of material 0.050 in. thick, has a sectional area of 0.51 sq. in. and weighs 1.77 lb. per lineal foot. Its moment of inertia is 0.35 in.⁴ about either axis, and its radius of gyration is 0.8 in. It withstood under compression 36,000 lb., or over

70,000 lb. per sq. in. After failure had started the load required to continue the destruction varied up to a maximum of 28,000 lb. As an indication of the weight efficiency, a structural-steel T-section, with the same moment of inertia about its most effective axis, weighs 3.56 lb. per foot, and to secure the same moment of inertia about the least effective axis would require a section weighing 6.4 lb. per foot. A T-section with a least radius of gyration of approximately 0.8 in. weighs 10.5 lb. per foot. The section illustrated, owing to the varying nature of the imposed loads, has the least efficiency of any of those used in the structure. Others carry not less than 100,000 lb. per sq. in. under similar tests.

The tenacity of the welds is also clearly indicated in the illustration of the failed specimen. The Shotweld process, developed and patented by the Edward G. Budd Manufacturing Company, effects a specific regulation of the pressure, the electric current value and the duration of its flow, thus maintaining unimpaired the strength and corrosion-resisting properties of the material. The welds develop a shearing strength of 75,000 lb. per sq. in. and will withstand torsion up to 90 deg. before rupture. All welding in the structure of the Burlington train was done by this process.

The floor structure is made up of a corrugated sheet of stainless steel, the bottoms of the rectangular corrugations of which are welded to a flat sheet and both in turn welded to the longitudinal stringers, of which there are eleven across the car. These, in turn, are secured to transverse supports built into the car frame. The floor thus forms a stiff horizontal girder through which end loads are distributed to the side girders. In the baggage compartments it is designed for a loading of 600 lb. per lineal foot.

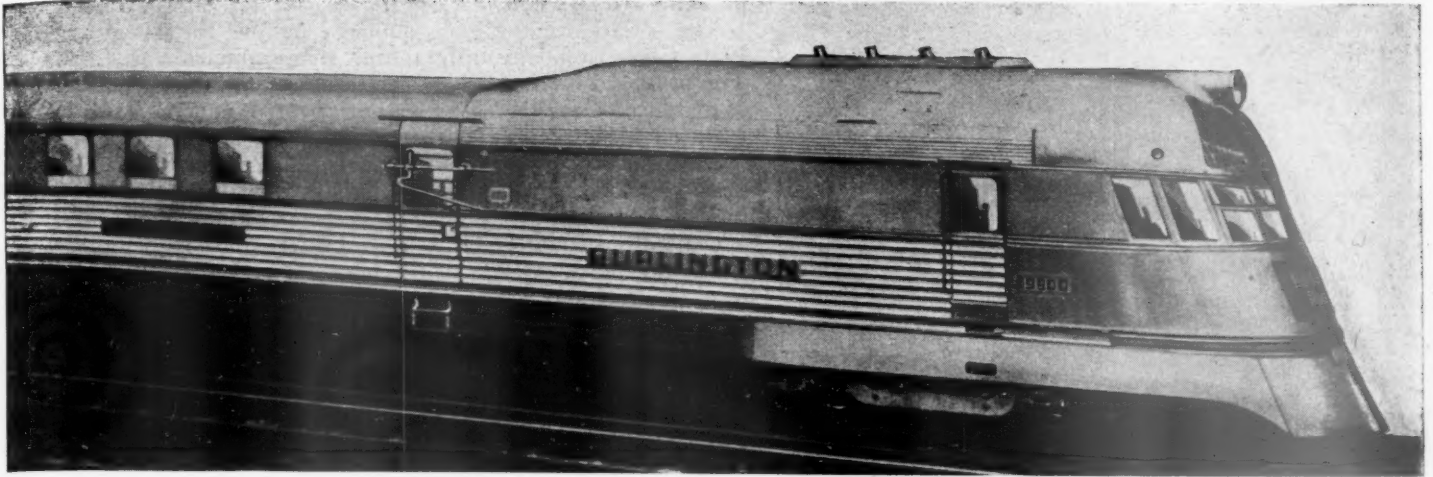
The roof constitutes a primary structural member assuming the entire compression load. It is built-up of longitudinal corrugated sheets welded to roof carlines and is locally reinforced at points of maximum stress. The roof-sheet corrugations are $\frac{7}{16}$ in. deep, with a pitch of $1\frac{1}{2}$ in.

In cross-section the car assumes something of tubular form. The enclosure below the floor, however, is of only incidental value as a part of the load-carrying structure and the trussed center sills are designed primarily to serve as means of attachment for apparatus, to stabilize the floor beams and to serve as local reinforcement.

Among the special features in the structure which are of particular interest are the engine bed and the method of tying the articulation castings into the framing of the coach bodies. The engine bed, fabricated by Lukenweld,



A Solarium-Lounge Is at the Rear End of the Train



and Driven by a 600-Hp., Two-Cycle Diesel Engine

Inc., is a rigid arc-welded structure of steel plate, annealed after completion of the welding. It forms a combination bumper, engine bed and bolster and is 25 ft. $3\frac{1}{2}$ in. long, by 8 ft. 8 in. wide. The material is Lukens Steel Company Cromansil, an alloy of chromium, manganese and silica, with a tensile strength of 90,000 lb. and an elastic limit of 70,000 lb., possessing a high resistance to fatigue and shock. The completed structure weighs 6,070 lb. It is built into the lower chord member of the side trusses and forms the foundation for the nose structure of the car.

The nose construction consists of a deep, stiff member which extends diagonally outward and downward on the longitudinal center plane of the car from the roof to the bumper portion of the engine bed. This is reinforced with a stiff horizontal arch at the belt rail and with a diaphragm which forms the bottom of the engine-cooling air-intake chamber above the cab windows. The diaphragm is composed of two 0.109-in. stainless-steel sheets welded together and reinforced with stiffeners.

Each articulation casting is tied into the frame structure at the end of the car by riveting to the center sills, to the end posts and to the lower chords and vertical members of the stainless-steel end trusses. No rivets other than these are used in the structure. The transverse horizontal arms of the castings extend out only far enough to carry the side bearings, and the load is carried to the side frames through the end truss structure with a considerable saving in weight. Through the stiff end structure the reaction from the weight on the truck center plate is carried to the main side frames. The greater part of the bending moment due to the eccentric loading at the center pin is resisted by compression loading in the roof and the remainder by a bending stress in the center sills. The end posts are built-up of $\frac{1}{8}$ -in. stainless-steel plates and are 12 in. deep.

Unlike the stainless-steel cars previously built by the Budd company, the sheathing on the Burlington train is not all of the fluted type adopted to prevent the formation of shear lines and other weaves which would develop in the 0.020-in. sheets. Uncorrugated sheets of stainless steel are used around the curved surfaces at the front and rear ends of the train, on the curved roof at the rear end, and on the roof over the engine room. Except on the front end, where plates are $\frac{1}{8}$ in. thick, the material is 0.030 in. in thickness.

The deadlight panels are also finished with smooth surfaces. These panels are of Plymetl, in which the outside surface of the plywood is covered with stainless steel and the inside with copper to prevent warping. These panels, some of which are of unusual length, are flexibly mounted

in channels at the top and bottom, in which they are sealed with a plastic calking material. Below the window rail are mounted the customary fluted side sheets.

The space below the floor level is enclosed with light corrugated sheathing similar to the roofing. To prevent resonance from air-borne noises and direct concussions this sheathing is insulated with hair felt placed between two layers of 80-lb. Craft paper, the outer of which is cemented to the sheathing.

The walls and roofs of the cars are insulated throughout with Alfol. This material, which is made up of several sheets of crinkled aluminum foil, weighs about $\frac{1}{4}$ oz. per ft., board measure. It combines low conductivity with low convection air spaces and high reflectivity.

In the passenger compartments the side walls are fin-



Front End of the "Zephyr"

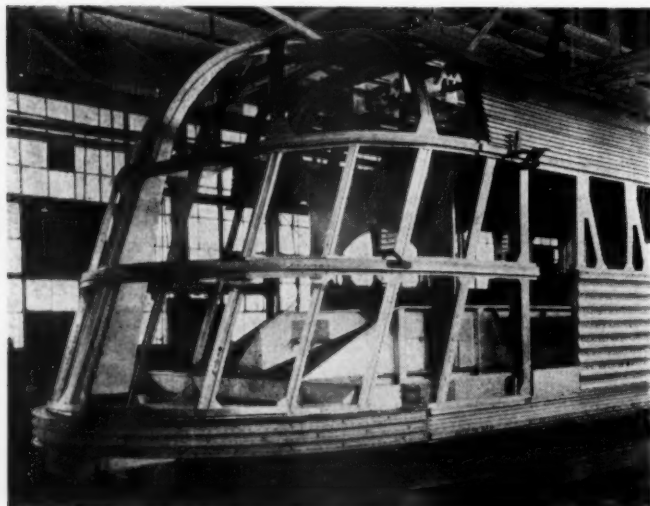


A 14-In. Section of a Structural Member Tested to Destruction Under Compression—It Withstood Over 70,000 Lb. Per Sq. In.

ished with Masonite panels. The headlining is of Agasote. The walls of the baggage rooms are finished with galvanized sheets. The floors are laid with $\frac{5}{16}$ -in. cork tiling cemented over the corrugated steel and cork filler in the recesses of the corrugations. In the mail compartment 1-in. maple flooring is laid over the cork. In the baggage compartment a layer of roofing paper is placed between the cork and the maple flooring.

All doors, when closed, form unbroken surfaces with the outside sheathing of the car. The doors serving the passenger compartments are of the swinging type and give access to step-wells in the floor which are closed by trap doors. The bottom step folds up when the door is closed and, together, they form an unbroken surface with the undersheathing adjoining the step wells. The side doors in the two baggage compartments and in the railway postoffice are of the sliding type. They are guided in top and bottom tracks so shaped as to move the door outwards into its flush position in the door opening when it is closed.

Vestibule passages between the car bodies are enclosed by diaphragms bolted to the ends of the cars. The foot plate is formed by an approximately semi-circular plate, its straight edge secured to the end of one car and the circular edge enclosed in a horizontal recess in the end of the opposite car within which it is free to slide when the cars pass over curved track. To provide continuity of the outer surfaces accordion type dia-



Front-End Frame Structure Showing the Welded Engine Bed

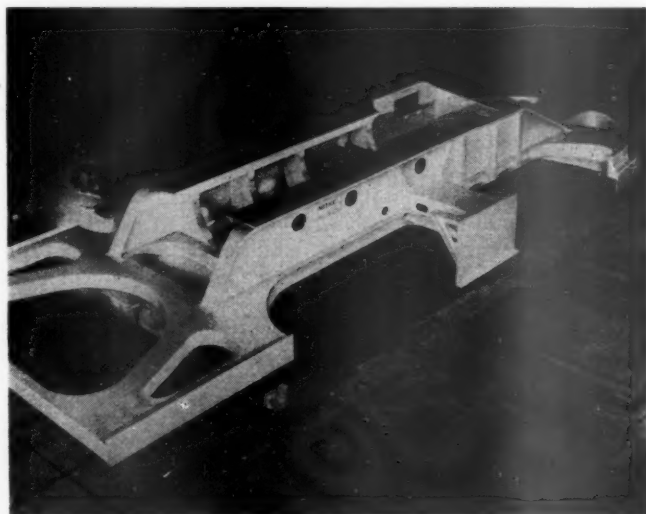
phragms are attached between the ends of adjoining cars.

The safety window glass supplied by the Pittsburgh Plate Glass Company differs from that ordinarily used. The proposed high speeds of the train and the large area of glass called for increased strength over what would be required in automobile use, but this strength had to be obtained, if possible, without any additional weight. The glass which was finally approved was 15 per cent lighter than the standard safety plate glass and much stronger.

Generally speaking, the weight of safety glass is in the glass and the strength is in the plastic sheeting. Therefore, the thickness of the plate glass for this special laminated product was reduced from $\frac{7}{64}$ in. to 0.09 in., and the thickness of the plastic was raised from 0.025 in. to 0.050 in. for the safety glass to be used in the rear and side windows and to 0.075 in. for the safety glass in the front windows. In order to overcome the problem of

Partial List of Equipment and Specialties on the Burlington "Zephyr"

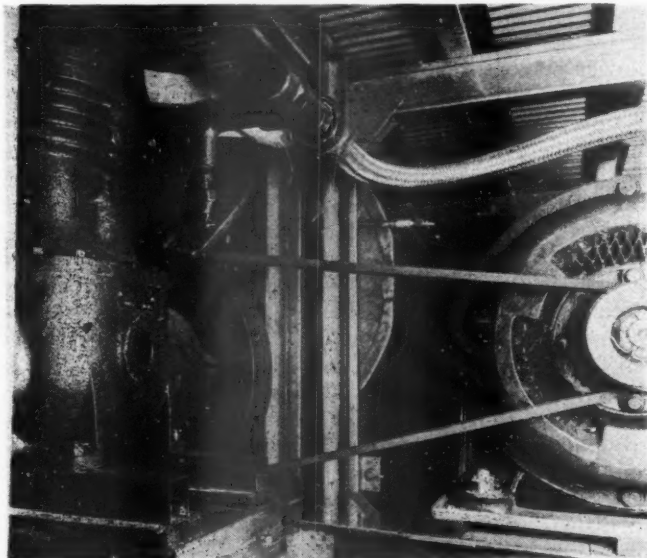
Builder	Edward G. Budd Mfg. Co., Philadelphia, Pa.
Stainless Steel	Allegheny Steel Co., Brackenridge, Pa.
	American Sheet & Tin Plate Co., Pittsburgh, Pa.
	American Steel & Wire Co., Chicago.
	Republic Steel Corp., Youngstown, Ohio
	Superior Steel Co., Pittsburgh, Pa.
Helical volute springs	Cyrus J. Holland, Chicago



The Welded Engine Bed

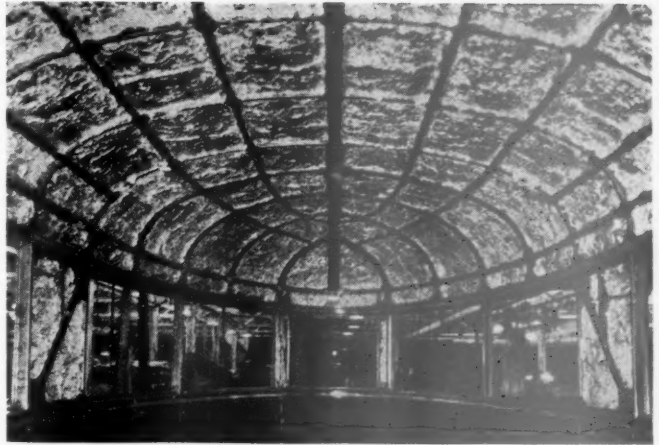
Elliptic springs	Mather Spring Co., Toledo, Ohio
Coil springs	American Steel Foundries, Chicago
Brake rigging	American Brake Shoe & Foundry Co., New York
Brake shoes	Lukenweld, Inc., Coatesville, Pa.
Engine bed	General Steel Castings Corp., Eddystone, Pa.
Truck and body articulation castings	Bethlehem Steel Co., Bethlehem, Pa.
Wheels and axles	A. Stucki Co., Pittsburgh, Pa.
Railway postoffice	Timken Roller Bearing Co., Canton, Ohio
Side bearings	U. S. Rubber Co., New York
Axle bearings	Quaker City Rubber Co., Philadelphia, Pa.
Rubber insulation	Continental Rubber Co., Erie, Pa.
Rubber bumpers	Dryden Rubber Co., Chicago
Rubber	Goodrich Rubber Co., Akron, Ohio
Air brakes	Westinghouse Air Brake Co., Wilmerding, Pa.
Hand brake	National Brake Co., Buffalo, N. Y.
Flexible metal hose	American Flexible Metallic Tubing Co., Philadelphia, Pa.
Flexible metal hose	Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Couplers	McConway & Torley Corp., Pittsburgh, Pa.
Equalizer	Camden Forge Co., Camden, N. J.
Power plant, complete	Winton Engine Co., Cleveland, Ohio
Oil pump	Viking Pump Co., Cedar Falls, Iowa
Oil radiators	Young Radiator Co., Racine, Wis.
Ventilating fans	B. F. Sturtevant Co., Boston, Mass.
V-belts	Dayton Rubber Co., Dayton, Ohio
Sidelineing	Masonite Corp., Chicago
Headlining	Agasote Milboard Co., Trenton, N. J.
Weatherstripping	Midgley & Borrowdale, Chicago
Insulation	Alfol Insulation Co., New York
Felt	Fidelity Felt Co., Philadelphia, Pa.
Diaphragms between cars	Morton Mfg. Co., Chicago

Lounge chairs and tablesS. Karpen Bros., Chicago, furnished by
Mandel Bros., Chicago
Seats and partitionsHale & Kilburn, Philadelphia, Pa.
Seat covering and carpetsL. C. Chase Co., New York, furnished by
Mandel Bros., Chicago
Copper screenNewark Wire Cloth Co., Newark, N. J.
Rubber weatherstripManhattan Rubber Co., Passaic, N. J.
SashO. M. Edwards Co., Syracuse, N. Y.
Window glassPittsburgh Plate Glass Co., Pittsburgh, Pa.
Door locksRussell Erwin Co., New Britain, Conn.
Door tracks and hangersRichards-Wilcox Co., Aurora, Ill.
HingesHomer D. Bronson, Beacon Falls, Conn.
Soss Mfg. Co., Roselle, N. J.
Stanley Works, New Britain, Conn.
Castings (assist door handles).....American Chain Co., Bridgeport, Conn.
Plymetl dead light panelsU. S. Plywood Co., New York
Insulation and fibrous adhesive.....Johns-Manville Co., New York
LumberSykes Lumber Co., Philadelphia, Pa.
MoldingHerron-Zimmer Molding Co., Detroit, Mich.
Martin Parry Co., York, Pa.
Cork floorArmstrong Cork and Insulation Co., Lancaster, Pa.
Stainless steel engine-cooling
grilleTuttle & Baily, New Britain, Conn.
BuffetAngelo Colonna, Philadelphia, Pa.
Table topsFormica Insulation Co., Cincinnati, Ohio.
Air-conditioning and coolingYork Ice Machinery Corp., York, Pa.
All pipe insulationKeasbey & Mattison Co., Ambler, Pa.
Air duct insulationCelotex Co., Chicago, Ill.
Air filterBrillo Mfg. Co., Philadelphia, Pa.
Freon refrigerantKinetic Chemicals Co., Wilmington, Del.
Exhaust fansRobbins & Meyers Co., Springfield, Ohio
Air-conditioning grillesUni-Flo Grille Corp., Detroit, Mich.
Heating and cooling controlsPennsylvania Electric Switch Co., Des
Moines, Iowa
Heating plant and thermo-static
controlsVapor Car Heating Co., Chicago
RadiationJ. A. Nesbitt, Inc., Philadelphia, Pa.



One of the York Refrigerant Compressors in Place in the Underbody

Conduit fittingsCrouse-Hinds Co., Syracuse, N. Y.
Storage batteriesElectric Storage Battery Co., Philadelphia,
Pa.
Electrical fittingsArrow, Hart & Hegeman Co., Hartford,
Conn.
Electric power equipmentGeneral Electric Co., Schenectady, N. Y.
Air compressors
Auxiliary battery charging
generator
Electric grills and urns
Bearings on main driving mo-
tors, ventilating equipment
and air-brake equipmentS K F Industries, Inc., Philadelphia, Pa.
Lamp bulbsNational Lamp Co., Cleveland, Ohio
Lamp regulator and fixturesSafety Car Heating & Lighting Co., New
York
Fans in railway post office
Conduit and light fittingsTaplet Mfg. Co., Philadelphia, Pa.
Fuse blocksTrumbull Electric Co., Plainville, Conn.
Nofuze load centersWestinghouse Elec. & Mfg Co., East Pitts-
burgh, Pa.
WireGilby Wire Co., Newark, N. J.
Okonite Co., New York
Drape curtain rodsKirsch Co., Sturgis, Mich.
Curtain material (drapes)Bassett McNabe Co., Philadelphia, Pa.
Rolled curtainsAdams & Westlake Co., Chicago
CurtainsPantasote Co., New York
Waterproof carpet runnerJohn Wanamaker, Philadelphia, Pa.
Lamps and smoking standGauger Biddle, Philadelphia, Pa.
RadioStromberg-Carlson Tele. Mfg. Co., Roches-
ter, N. Y.
Converter for radioElectric Specialty Co., Stamford, Conn.
Special fittingsCrane Co., Chicago
Piping and fittingsChase Brass & Copper Co., Waterbury,
Conn.
Lavatory equipmentDayton Mfg. Co., Dayton, Ohio

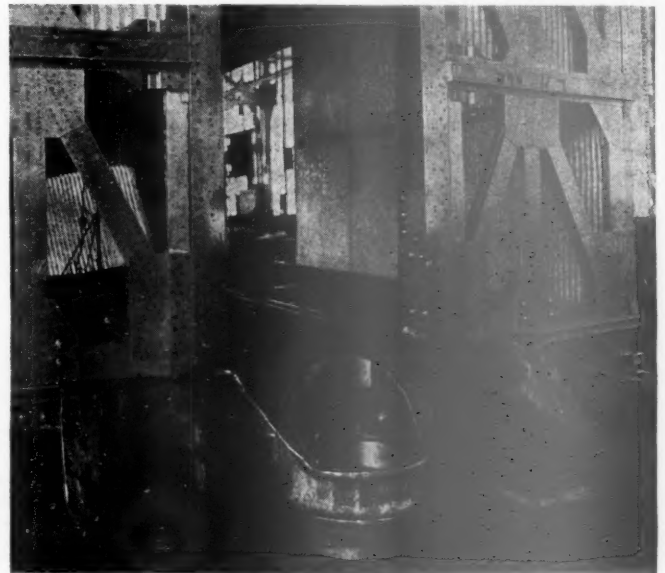


The Insulation in Place Ready for the Application of the Interior Finish

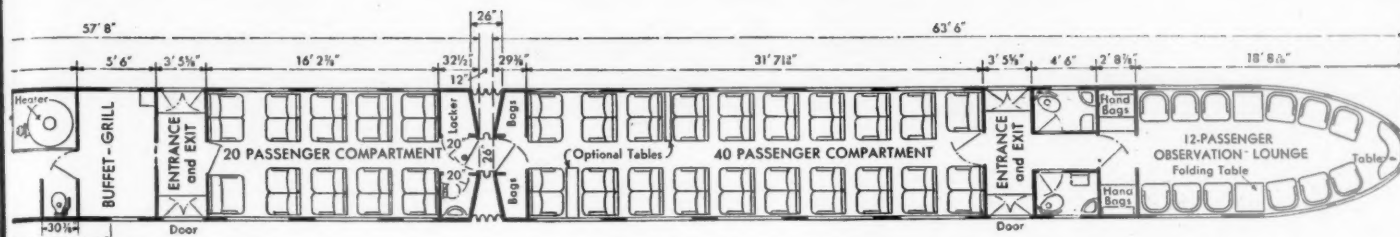
Paper cups and dispensersLogan Drinking Cup Company, Worcester,
Mass., Division of United States En-
velope Company
Paper towels and cabinetsNorthern Paper Mills, Green Bay, Wis.
Water coolersHenry Giessel Co., Chicago
Enamel, baggage room, post of-
fice, engine roomLarkin Co., Inc., Buffalo, N. Y.
SpeedometerWeston Electrical Instrument Co., Newark,
N. J.
SandersGraham-White Sander Co., Roanoke, Va.
Signal valveNational Pneumatic Co., New York
Whistle valvesLunkenheimer Co., Cincinnati, Ohio
Tyfon hornsLeslie Mfg. Co., Lyndhurst, N. J.
Monel screws and nutsInternational Nickel Co., New York
Fibre nutsElastic Stop Nut Corp., Elizabeth, N. J.
Head and back-up lightsElectric Service Supplies, Philadelphia, Pa.
Marker and classification lights,
conduits and light fittingsPyle-National Co., Chicago
Oilite center bearing platesAmplex Mfg. Co., Detroit, Mich.
Clear vision mechanismMotor Products Corp., Detroit, Mich.

severe weathering a special plastic sheeting was used which is highly resistant to the ultra-violet sun rays and the glass is developed to almost entirely filter out these rays. With this double protection it is expected that the glass will outlive the train.

Because of the type of construction it was calculated that there would be a certain amount of weaving of the coach bodies which would crack the glass under usual glazing methods. A system was developed of setting it in dum-dum putty, a non-hardening material, which allows play but still hermetically seals the windows to



The End Frame and Articulation Casting



Burlington Zephyr

wound machine placed forward of the engine and directly connected through a flexible steel-disc coupling. A direct-connected exciter is used for generator excitation purposes to give inherently the generator characteristic which permits full engine utilization over a wide range of train speed. A shaft extension is provided at the exciter end of the main generator to drive through V-belts a 25-kw. auxiliary generator mounted above the main generator. The opposite end of the auxiliary generator shaft is also extended for V-belt connections to the two fans which draw air into the engine room.

The two traction motors are mounted on the front truck of the leading car. They are series-wound motors of General Electric manufacture, having axle-bearing linings suitable for a 7 1/2-in. axle and a double nose for spring support on the truck bolster. The gearing is single reduction with a 25-tooth pinion and a 52-tooth gear. The armatures have SKF roller bearings and the axle bearings are of the sleeve type.

The traction motors are self-ventilated by multiple fans mounted at the pinion ends of the armatures. Ventilating air is taken from the engine room through canvas ducts, and motor ventilation is aided by the slight positive air pressure—about 1 in. of water—in the engine room.

Motor control consists essentially of one master controller, electro-pneumatically operated motor contactors, and reversor, together with the necessary auxiliary magnetic contactors, switches, relays, etc. The control provides for operation from the front of the train only and for starting and stopping the engine, regulating headlights, cab lights, etc. The traction motors are progressively connected in series, parallel and parallel-shunted-field combinations with transfer from one connection to the next higher effected manually.

The 25-kw. two-bearing 76-volt auxiliary generator is of the four-pole direct-current commutating-pole type. The output of the generator is furnished to the air compressors, the air-conditioning equipment, motor for train heating boiler, battery charging, lights, control, buffet utensils, etc., at a constant voltage regardless of load, over a range of engine speed from idling to full speed, including engine regulation. This has been made possible by the combined effect of inherent regulation and the use of a new dynamic relay.

The storage battery is an Exide Ironclad 32-cell, 64-volt battery rated at 450 amp. hr. at the 10-hr. discharge

rate, which is placed in a stainless-steel battery pit in the engine room. The weight of the battery is 3,260 lb. Ventilating scoops are used to increase air circulation in the battery box. The battery is used for engine cranking in addition to supplying power to the auxiliary circuits.

Two General Electric 25-cu. ft. air compressors, driven by 76-volt motors, furnish the necessary air for

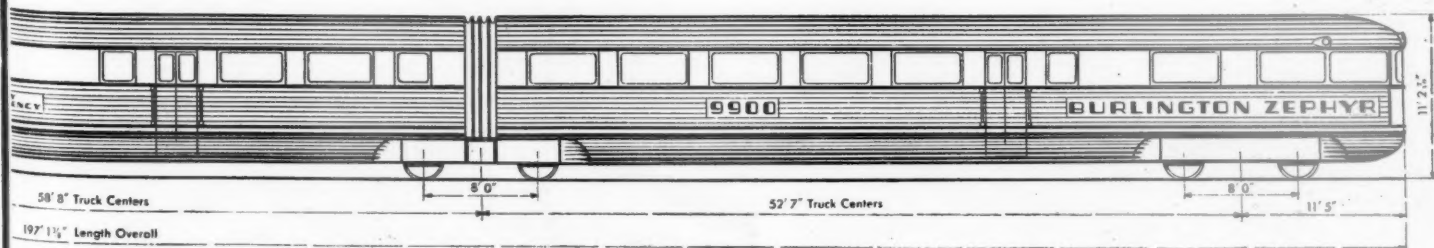


Interior of the Baggage Car Framing Showing Local Reinforcing of the Roof

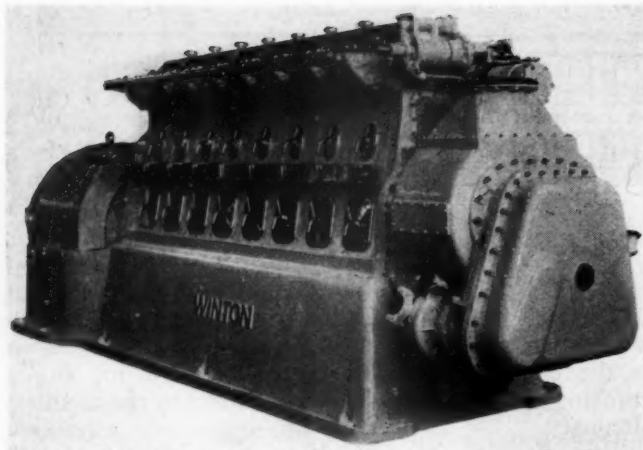
the train. These compressors are of standard design, but with aluminum frame parts to obtain a light-weight equipment.

The Trucks

The four trucks are all of conventional outside bearing type of construction. All have cast-steel frames and bolsters, furnished by the General Steel Castings Corporation. Their combined weight is 55,000 lb. without the motors and gears in the power truck. The power



of the Burlington Zephyr



The Winton Eight-Cylinder, 600-Hp., Two-Cycle Diesel Engine

truck, in which are mounted the two traction motors, has 36-in. wheels. This is the front truck and carries the weight of the power plant. The trailer trucks, although of the same general type, are considerably lighter in construction and run on 30-in. wheels. All journals are fitted with Timken roller bearings. The axles are hollow-bored to reduce weight.

Of particular interest in the construction of the trucks is the extensive use of rubber insulation to prevent the transmission of sound and other high-frequency vibrations to the car bodies. There are inserts under the center plate, in both top and bottom equalizer spring seats and between the ends of the equalizers and journal boxes. Rubber liners in the pedestals are faced with Oilite metal plates, vulcanized on, which serve as bearing surfaces for the faces and flanges of the boxes. The bolster pads, which insulate the bolster from the truck frame, are also faced with Oilite metal. In addition to the pad under the center plate, rubber thimbles are provided around the king pin and the center-plate bolts, the latter also including washers. A further precaution against unnecessary noise is the provision of automotive brake lining wherever the members of the truck brake rigging are likely to rub. To dampen vibrations of lower frequency Holland helical-volute springs are used on the equalizers of all four trucks. These springs consist of the conventional helical outer coil with an inner volute spring in place of the inner helical coil. The center plate bearing, the bearing between the articulation castings and side bearings are all faced with Oilite.

No two of the trucks carry the same load. With the train normally loaded the power truck is estimated to carry a weight at the rails of 98,000 lb.; the first trailer truck, between the first and second car bodies, 67,000 lb.; the second trailer truck, between the second and

third car bodies, 45,000 lb., and the third trailer truck, at the rear end of the train, 30,000 lb. The nominal journal sizes are, respectively: Power truck, 6 in. by 11 in.; first trailer, 5½ in. by 10 in.; second trailer, 5 in. by 9 in.; third trailer, 4¼ in. by 8 in.

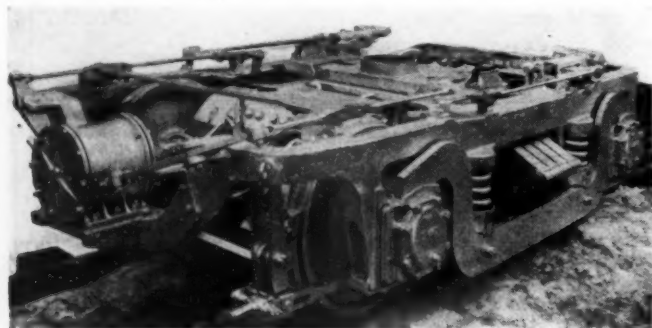
Brakes

The train is fitted with Westinghouse SME-3 brake equipment, which has been modified specifically for high-speed articulated train units. This is a straight-air system with emergency feature and also has a brake pipe which permits standard automatic operation of the brakes in case it should be necessary or desirable to move this train in connection with steam-train equipment. There are three air lines on the train: (1) The emergency pipe through which the supply reservoirs for each vehicle are charged at all times under normal operation and the loss of pressure from which causes the control valves to effect an emergency application of the brakes; (2) the straight-air pipe, pressure variations in which cause the control valves to effect graduated service application and release, and (3) the brake pipe by means of which automatic operation of the brakes can be effected when the articulated train is moving in connection with steam-train equipment or when backing up and on which the conductor's valve in the rear car is placed.

The brake valve operates the brakes by controlling the pressure in the straight-air pipe. It is self-lapping, the degree of service application varying with the position of the handle, a feature by which great sensitivity is attained. The dead-man control is operated either pneumatically by a foot pedal or electro-pneumatically by a push-button on the brake-valve handle. The release of both of these automatically cuts off the power and causes an emergency application of the brakes. The brake valve also provides, electro-pneumatically, for an emergency application of the brakes should a failure of pressure in the straight-air pipe prevent a response to a movement of the brake valve to service application position within a predetermined time interval.

In order to effect the high rates of retardation required to keep stopping distances from speeds of 100 or more miles per hour within present limits, the brake system is designed for a 200-per cent braking ratio at 100 lb. cylinder pressure. Because of the increasing coefficient of brake-shoe friction as the speed is reduced, the brake-cylinder pressure is controlled automatically as the train slows down by a retardation controller, a pendulum inertia device by which brake-cylinder pressure is reduced at a rate sufficient to maintain a constant predetermined retardation rate. The retardation controller is wired in the battery circuit to solenoids on the control valves and through these the control of brake-cylinder pressure is effected.

Aluminum has been used extensively in the air-brake equipment in the interest of weight reduction. This in-



The Power Truck



One of the Trailer Trucks



Photo by Wendell MacRae, New York

The Operator's Cab Has Clear Vision Through 180 Deg.—Cooling Air for the Engine Enters Through the Grilles Over the Cab Ceiling

cludes the control-valves and brake cylinders, etc. The supply reservoirs are of stainless steel.

The Heating System

The train is equipped with steam heat throughout. Each passenger compartment also has its own mechanical air-conditioning system. These are interlocked with the heating system so that the force-ventilation feature of the air-conditioning equipment is available both winter and summer.

Steam for heating is provided by an oil-fired Peter Smith boiler with an evaporative capacity of 500 lb. per hour at a pressure of 85 lb., furnished by the Vapor Car Heating Company. This boiler is located at the rear end of the baggage room in the second car. Its operation is completely automatic and, in order to reduce weight, the condensate from the radiators is returned to the 50-gal. feedwater storage tank. Storage is provided for 75 gal. of fuel oil.

The operation of the boiler is subject to three controls: (1) A water-level control; (2) a low-water control, and (3) a burner load control. The water-level and low-water controls are of the electrode, commonly called spark-plug, type. The electrodes are inserted in a container or bottle which is connected to the boiler in the same manner as a water column. They are of three lengths. The lower end of the longest one corresponds to low-water level and the vertical distance between the other two marks the variation in water level within which the feed pump is controlled. Current at 110 volts, furnished by a small motor-generator set, passes from the electrodes to their grounded metal container through the water. If the water drops below the end of the longest electrode, the failure of the current acts to close the oil-supply valve and stop the burner motor. A variation of the water between the ends of the intermediate and short electrodes serves to cut the feed pump in or out.

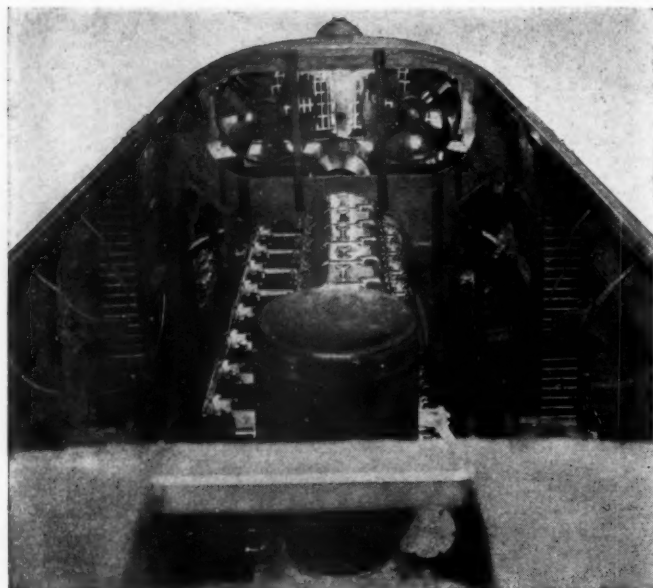
If pressure in the boiler builds up beyond a predetermined point owing to a load insufficient to utilize all of the steam being produced, a pressure switch operates automatically to reduce the flow of oil to the burner and the speed of the burner motor, thus maintaining a flame which is little more than a pilot light until such time as the reduction in pressure restores the flow of oil and the speed of the motor fan to their full load amount.

Heat is supplied to the passenger compartments from two sources. A fin-tube coil in the evaporator unit of the air-conditioning system in each compartment supplies heat to the fresh and recirculated air passing through the units to the compartments. Steam is also supplied to a copper fin-pipe along the truss plank near the floor on each side of the compartment. The admission of steam to both radiators is controlled by motorized valves which are actuated by independent thermostats. A thermostat for the control of the air-conditioner radiators is located on a deadlight panel near the center of each compartment about 5 ft. above the floor. The thermostat for the side-wall radiators is placed near the floor and serves to bring these radiators into action automatically when the heat distribution from the air-conditioning unit is not sufficient to maintain a predetermined temperature at the floor.

A unique scheme has been developed for returning condensate from the radiators of the front and rear cars to the feedwater storage tank on the second car. Water from the radiator traps drains into small sumps, one on each of the two cars. As the water level rises in the sump, a float causes a relay to open a solenoid valve in the brake pipe, admitting air to the sump under regulated pressure and forcing the condensate through a separate return line to the storage tank. During layover periods the entire train can be heated by steam from the terminal supply. The heating and thermostatic controls



The General-Electric A.C.-D.C. Motor Set which Drives the Two Air-Conditioning Compressors and Condenser Fans Under the Rear Car



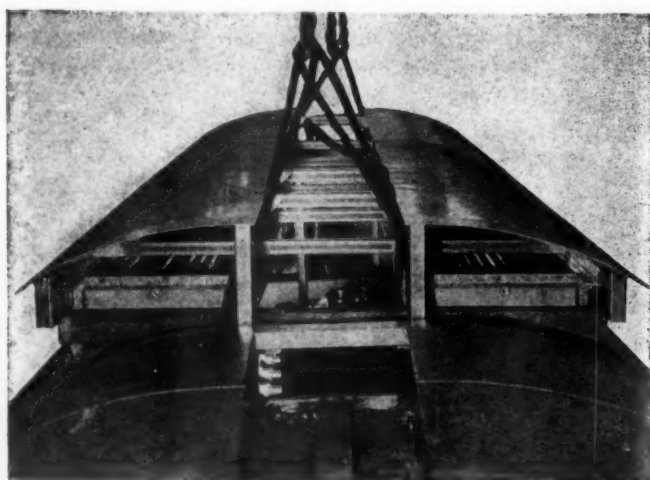
Looking Into the Engine Room with the Hatch and Radiators Removed

are the product of the Vapor Car Heating Company.

Air Conditioning

Each of the three passenger compartments is served by a complete York mechanical air-conditioning unit of $1\frac{1}{2}$ tons nominal capacity. The compressors as well as the condenser and evaporator units are all located within the underbody below the floors of the coaches. The evaporators deliver air through the grilles in the bulkheads over the center doors into the compartments. Recirculated air leaves the compartments through filter-protected openings in the floor over the evaporator units.

The motors for operating the compressors and the evaporator unit fans were manufactured by the General Electric Company. A $7\frac{1}{2}$ -hp. a.c.-d.c. motor operates the two compressors and the condenser fans on the third car and a 3-hp. d.c. motor drives the compressor unit and the condenser fan on the second car. For standby service when the main power plant is not in operation a tap from a 220-volt, 60-cycle terminal supply can be plugged in to operate the a.c. motor on the rear coach. This drives the two units on this coach and the d.c. motor becomes a generator which supplies current for reduced-capacity operation of the unit on the second car. The d.c. motors operate on 76-volt current from the head-end supply.



Lowering the Engine-Room Hatch Into Position—Engine Cooling Radiators Are Directly Attached to It

Two $\frac{1}{4}$ -hp. and one $\frac{1}{3}$ -hp. motors drive the evaporator fans.

The entire air-conditioning equipment has been designed with the requirement for light weight as a major objective. The evaporator units, including both steam and refrigerating fin coils, are aluminum. The compressor motors operate at 1,750 r.p.m. The complete equipment, including the motors and controls, has a total weight of about 2,400 lb., and with refrigeration lines, water lines, electric cables, etc., included, does not exceed 3,000 lb.

Copper pipe with sweated fittings has been used throughout the train for water, steam and air. Its use has effected a piping weight reduction estimated at 60 per cent. It is scale-proof and once installed possesses



The Peter Smith Automatic Oil-Fired Heating Boiler

a high degree of permanence. Because of the difficulty of access for replacement of some of the piping on the Burlington train, this factor was of considerable importance. Except for a few special fittings, no iron or steel pipe has been used.

Interior Decorations

The interiors of the passenger compartments in the Zephyr are all finished in pastel shades effectively used on the smooth wall surfaces without striping. The only ornamentation consists of the polished stainless-steel bands above the windows and along the ceiling at the open side of each lighting duct, and the stainless steel window sills. Each compartment has a distinctive color harmony to which wall colors, window drapes, upholstery and floor covering all contribute. In the smoking compartment the walls are finished in a pastel rose with golden rose window drapes. The seats are upholstered

in leather medium brown in color. The floor is covered with Linotile with a dark mottled surface neutral in tone. The lavatory and buffet floors are covered with linoleum to harmonize with the Linotile.

The walls of the main passenger compartment are finished in a warm gray with a hint of green. The seats in this compartment are upholstered with Chase Velmo low-pile mohair. The color is gray-green with a gold background, the pile woven to form a striped pattern. The silk window drapes in this compartment match the green of the upholstery. The floor is covered with a plain taupe Chase Seamloc carpet. In the lounge the walls are finished in gray, in this case with a suggestion of purple-blue. The furnishings consist of comfortable lounge chairs and tables. The frames of the chairs are of scratch-brushed aluminum and the upholstery is of a purple-blue with gold background. The material and the pattern are similar to that of the seat coverings in the pas-

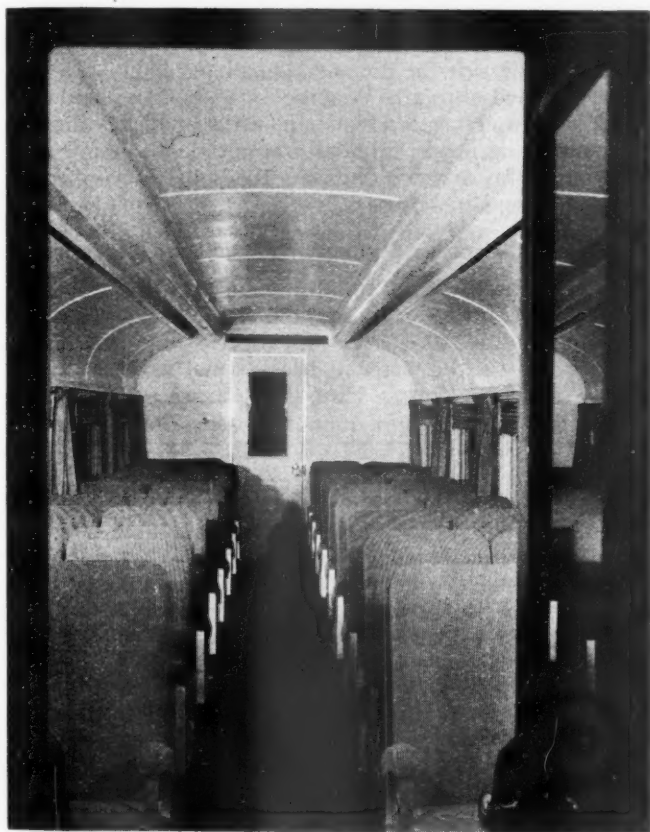


Photo by Wendell MacRae, New York

Looking Toward the Rear of the Main Passenger Compartment From the Smoking Room—The Air-Conditioner Grille Is Over the Door in the Bulkhead

senger compartment. The window drapes are of gold and the carpet is plain platinum-gray Chase Seamloc. The ceilings in all three compartments are finished in a light cream.

Furnishings

The tables in the lounge are finished in non-blistering Formica of the same shade of blue as the upholstery. The side tables have drop leaves and are edged with filigree stripes of aluminum.

The window shades are of Pantasote with an inside fabric facing of a neutral two-tone pattern which harmonizes with the color schemes in all three compartments. The windows in the lounge are not shaded, except with the heavy silk drapes. The outside surfaces of the window shades have an aluminum finish, which closely



Looking Toward the Front End of the Main Passenger Compartment—The Radio Loud Speaker Is Behind the Grille in the Bulkhead at the Right

matches the unpainted stainless-steel exterior of the train.

In the smoking and passenger compartments the lighting is indirect, the lights being concealed within longitudinal ducts below the ceiling along each side of the car. The sides of these ducts toward the sides of the car are open and the light reflected from the curved inner surfaces of each duct and against the curve of the ceiling and the side of the car is diffused in a wide angle which reaches completely across the car at the reading height. The illumination on each side of the car is thus received from the lights in both conduits. The exterior of the conduit is blended into the surface of the ceiling by smooth flowing curves. The lighting is designed to produce an intensity of eight foot-candles at reading height. The lounge is lighted directly through diffusing glass which covers the underside of long ducts placed along the walls just above the windows.

The seats in the smoking and passenger compartments are built on light-weight aluminum frames. The height of the seat and the angle of the seat and back have been carefully chosen for travel comfort. The backs are ad-



Interior of the Railway Postoffice



Photo by Wendell MacRae, New York

Meals Are Served to the Passengers at Their Seats

justable from the normal upright to a semi-reclining position. They are built with a clear space 18 in. high underneath for the stowing of hand baggage. Facilities for holding overcoats and hats are provided by a metal rod and a spring clip fastened to the back of each of the paired chairs in the passenger and smoking compartments. Further storage space for luggage has been provided in racks on either side of the short passage at the front end of the rear car and also at the front end of the lounge. It has thus been possible to eliminate the conventional overhead racks for luggage and apparel and to preserve the motif of unbroken surfaces in the passenger compartments.

The train has a buffet which is equipped to supply grill service and to serve ice cream and both hot and cold drinks. It occupies a compartment 5 ft. 6 in. long across the center car. In the design of its equipment great ingenuity has been used to provide all of the necessary facilities, including ample refrigerator space, electric grills, urns for hot water and coffee, storage for dishes, cupboards for storage of foods, utensils, etc. Service may be provided either at the counter or at the seats in the passenger compartments. Removable trays, which can be bracketed between the seats, serve as din-



Photo by Wendell MacRae, New York

The Grill As Seen from the Front End of the Smoking Compartment

ing tables. These trays are finished in black nonblistering Formica with aluminum filigree stripes on the edges. The dishes, which have been especially made for the train, are a deep cream color, each decorated with a single band of gold and with the Burlington emblem in colors. The plates have a 1/2-in. rim instead of the conventional 2-in. bevel to conserve storage space and to fit the service trays without crowding. Communication with the buffet from each seat is made possible by an annunciator. All passenger compartments of the train have radio reception from a Stromberg-Carlson 11-tube radio receiver.

Lights

The front headlight is a 14-in., 250-watt, Golden Glow unit made by the Electric Service Supplies Company. The back-up light is a 9-in., 40-watt unit made by the same manufacturer. The marker and classification lights are Pyle-National airplane-wing lights in housings made by the Budd company. These lights are all built into the body of the train.

All lights inside the car and also all auxiliary apparatus are controlled through Westinghouse Nofuze load centers. Arrow, Hart & Hegeman heater switches provide for connecting inside lights all in multiple, for using only alternate lights and for dimming the lights by connecting the two groups in series.

Zephyr's Place in Burlington Passenger Operations

After a three weeks' tour of eastern cities, and a six weeks' tour of western cities, the Zephyr will be placed on exhibition at A Century of Progress in Chicago. At the close of the Fair it will be assigned to turn-around service between Kansas City, Mo., St. Joseph, Omaha, Nebr., and Lincoln, on a four-hour schedule for the 251 miles.

The main idea back of the Zephyr is an effort to reduce the cost of passenger train operation, particularly that of the two- to five-car trains that are now handling head end and passenger business with little or no profit, and which produce 25 per cent of the passenger train mileage of the Burlington. At the same time, it is hoped that the train will have a sufficient appeal to the public to attract more business. With these objectives in mind, the Zephyr was designed especially to meet the conditions prevailing between Kansas City and Lincoln rather than as a train that can be used in any territory.

The distance from Kansas City to Lincoln is short enough so that an appreciable stepping up of train speeds will permit of a schedule that will give the passengers considerable time during business hours either before the beginning of the trip or after its termination. Because the bulk of the traffic of present trains is toward Kansas City in the morning, the Zephyr will leave Lincoln at about 8 a.m. and will arrive in Kansas City at noon. It will return during the afternoon of the same day. The schedule adopted will make it possible to eliminate two locomotives and six passenger train cars which equipment has a total weight equal to eight times that of the Zephyr.

The physical conditions of the route are such as to require only moderate expenditures to place the track in condition for high speed movements. The curvature and gradients are moderate; only nine per cent of the curves are in excess of one degree and only one per cent are in excess of three degrees. Wye or loop tracks are available at both Kansas City and Lincoln on which the train may be turned around. High speeds between Kansas City and Omaha are favored, also, by the fact that there are only six highway grade crossings in that distance.

Analyzing the Railroad Research Problem*

A frank discussion, with suggestions and constructive criticism, of a much misunderstood subject

By Dr. A. A. Potter

Dean of Engineering and Director, Engineering Experiment Station, Purdue University



Draft-Gear Testing Laboratory, Purdue University

THE past record of the American railroads needs no defense and their indispensability in connection with our future social and economic progress cannot be questioned. Railroad management has been fully appreciative of the fact that operation and maintenance of railway equipment require constant study and vigilance. During the period from 1923 to 1933, inclusive, the American Railway Association expended nearly 6¾ million dollars for research, experimentation, testing and standardization, while additional sums, the total of which it is difficult to estimate, have been expended for testing, development and research by individual railroads and by manufacturers of equipment. However, one hears too frequently implications that the railroad companies have

The railroads have been criticized for not applying principles of scientific research more fully to the solution of their problems and it is contended that as a consequence, their progress has been materially retarded. Are these accusations well founded? Have the railroads really failed to keep abreast of the times? As an engineering educator of nation-wide prominence, and himself an authority on research, Dr. Potter is exceptionally well qualified to discuss these questions.

stood still and have neglected to make full use of new science to insure their future programs with a degree of certainty.

The questions before us then are: First, what is research; second, are the railroads constantly alert to the new scientific developments which come from the outside; and third, how can railroading make greater use of basic scientific knowledge to improve service, reduce costs and increase earnings?

Definition of Research

What is research? Research is a fact-finding agency. It has as its aim the orderly search for something hitherto unknown, by the employment of facts. To most people research means search for new knowledge in the fields of biology, physics, chemistry or in applied science, such as engineering. The search for truth by the fact-finding method, however, applies to human as well as to material problems; to advertising, marketing and personnel

matters as well as to development, design, manufacturing, maintenance and service; to psychology, economics, sociology, and politics as well as to biology, physics, chemistry and engineering. No clear cut differentiation can be drawn between pure scientific research and engineering research, although the latter is generally concerned with results of immediate economic value. The difference between development and research is also far from distinct. Development usually follows basic research if a marketable product is the aim, but development must involve fact-finding technique through experimentation and testing. All types of scientific research, whether pure or applied, require testing and experimentation.

Thus it matters little whether the fact-finding activities of the railroads are called research or development or testing or experimentation, provided they are useful in securing facts to guide decisions with reference to equipment purchases and maintenance as well as for the improvement of operation and service. An analysis of the railroad research program during the past 40 years, however, leads one to question whether the railroads have fully utilized research to explore new opportunities or have been satisfied merely to employ experimentation and testing to improve present devices and methods. Statements have even been made that the present condition of the railroads would have been much better had they explored absolutely new paths and had watched more carefully developments taking place in other fields. Accordingly, it may be well to appraise the activities of the fact-finding agencies that are associated with the railroads. These include the equipment manufacturers, the individual railroads and the American Railway Association.

Contributions of the Equipment Manufacturers

The equipment manufacturers have contributed greatly to the increased output of American railroads per dollar of investment and per employee by improvements in plant. While some of the leading European railroads build two-thirds or more of their locomotives in their own shops, the majority of American locomotives have been built by manufacturing companies that specialize in locomotive design and construction. The marked in-

* Abstract of an address presented before the American Railway Engineering Association, at Chicago on March 14.

crease during the past decade in the power output per driving axle and the reduction during the same period of about twenty per cent in fuel consumption per passenger-train car-mile and of nearly thirty per cent in fuel consumed per ton-mile of freight hauled are an indication of the progress made by American locomotive builders and by manufacturers of locomotive auxiliary and accessory equipment.

Paralleling the improvements in steam locomotives are the great strides that have been made in electric locomotive design as well as in internal-combustion-driven rail cars and Diesel-electric locomotives for special service. Apparently the manufacturers of car equipment are also appreciative of the contributions of research and are saving car weight by the use of welded steel construction and light weight materials. The manufacturers have also expended large sums to insure improved air brakes, better car cushioning, more effective bearings and superior lubrication. Time will not permit a detailed discussion of the improvements made by manufacturers individually and co-operatively in car trucks and parts, car wheels, automatic couplers, draft gears, or in special equipment for locomotive repairs and for the upkeep of tracks and structures, or in signaling.

The contributions of the equipment manufacturers to new knowledge are many and most pertinent, but there is a feeling in certain quarters that research and development by equipment companies are guided largely by their own ideas of the railroads' needs rather than by definite recommendations by the railroads as to the nature of their requirements. Statements have also been made that the railroads consider competition between manufacturers of equipment as a sufficient guarantee of superior products. To what extent these statements are true is difficult to determine, but a closer co-ordination of the research activities of the equipment companies and those of the railroads should aid in avoiding such practices if they exist.

There is apparently no complete published record of the testing and other research facilities of individual railroads. Most railroads maintain their own test departments and have sufficient laboratory facilities for physical and chemical tests. The laboratories of the Pennsylvania at Altoona, Pa., the New York Central at West Albany, N. Y., the Atchison, Topeka & Santa Fe at Topeka, Kan., and those of other important lines are utilized for carrying on some experimentation of a high order as well as for testing. Individual railroads should receive considerable credit for the recent advance in the air conditioning of passenger cars, the pre-cooling of sleeping cars, streamlining and light-weight trains, improved locomotive performance, and the use of improved types of bearings. However, the creative efforts of the individual railroads are evidently not definitely co-ordinated, resulting in considerable duplication.

Research Activities of the A. R. A.

During the past 11 years (1923-1933, inclusive) more than one-half of the fact-finding expenditures of the American Railway Association, or over 3¼ million dollars were devoted to the Mechanical division, the major portion of which was expended in connection with investigations pertaining to air brakes, draft gears and automatic train connectors. The Mechanical division has had a part-time director of research for a number of years, but the other divisions have depended entirely upon committees. Even in the Mechanical division the part-time director has been concerned only with a portion of the fact-finding activities, the remainder being also directed by committees.

While the industry and ability of the members of these

committees cannot be questioned, it is evident that they are mainly concerned with operation, are only rarely research specialists and are usually too busy with their regular duties to devote the time necessary to direct and co-ordinate research. Members of committees are usually selected because of geographical distribution or availability. Furthermore, the committees have usually been appointed to handle routine matters, thus leaving the research problem with little if any direction. Moreover, the committees are appointed to remedy existing troubles, rarely being concerned with new problems or novel methods, and are not in a position to keep the railroads fully informed of developments which take place outside of railroading.

Apparently the A. R. A. co-ordinates its research activities to some extent but not entirely. While the present part-time director is in touch with some of the mechanical phases of railway research he has nothing to do in co-ordinating the fact-finding activities of the



Air Brake Testing Rack at Purdue University

other divisions, of the individual railroads or of the equipment manufacturers.

Great credit should be given to the Engineering division of the A. R. A. for the present standard rail section and for basic investigations of problems pertaining to rails, grade crossings, the preservative treatment of ties, transverse fissure rail failures and stresses in railroad track. However, a full-time director of research should prove helpful in bringing about more effective co-operation between all the divisions and bureaus of the A. R. A., as well as between the individual railroads. Such a director, if supplied with an adequate and capable staff, might also be able to bring about a closer co-operation between the railroads and the equipment manufacturers. Furthermore, centralized and authoritative research direction should prove helpful in encouraging investigations on a larger scale than is possible with the present committee system.

Central Research Direction Needed

Effective centralized direction requires a director, assisted by a trained research staff, whose only duty would be to undertake the solution of new problems for the benefit of all the railroads. Such research should be carried on in a laboratory centrally located. The campus of an engineering college might prove a suitable place for building such a laboratory, as it would then be in an atmosphere sympathetic to research. Such an ar-

rangement might also prove advantageous to the railroads from a financial standpoint, as the staff, laboratory equipment and library of the engineering college could be utilized to a considerable extent. The United States Forest Products Laboratory at the University of Wisconsin and the Tanner's Laboratory at the University of Cincinnati are examples of centralized research laboratories at educational institutions.

Centralized direction of research administered jointly by all the railroads would not invade the field of the individual railroad test department and should supplement the laboratories of equipment companies. Such centralized direction would, however, definitely correlate all the valuable research activities of the railroads and of the manufacturers of equipment and would make possible the pursuit of many basic transportation studies which are now difficult to undertake due to the competition between the railroads themselves as well as between the railroads and other modes of transportation. A centralized railroad research agency would also handle patent matters referred to it by railroads.

Research, to be most productive in revealing new possibilities and in forecasting future trends, must be continuous and cannot be started and stopped on short notice. Many years are required to build up a high-grade research organization and only centralized direction, a central laboratory and a long time research program may be expected to yield permanent results.

With reference to the types of problems that might be undertaken by a central research laboratory, consideration may well be given to such subjects as the attainment of better riding qualities, improved ventilation, greater cleanliness and reduction of noise in passenger cars; the elimination of shocks in train handling; mathematical study of springs on vehicles; dynamic balancing of more powerful high-speed motive power; improved prime movers of superior fuel economy; better light-metal alloys; new uses and applications of the findings of science; and experimentation with types of equipment leading to different operating procedure. Central direction of research, if properly financed, may hasten the solution of such problems as the transverse fissure in rails by extensive studies under controlled conditions. However, research should not be satisfied merely to remedy existing difficulties, but should strive constantly to develop new ideas, better devices and improved methods, while keeping fully informed of new facts revealed by other industries. Research should back away from things at hand and view transportation as a whole.

Would Not Limit Activities

Centralized research should not limit its activities to science and technology, but should encompass all subjects, including business and human research problems. Examples of non-technical problems are rates and fares, traffic, railroad financing, wage scales and personnel matters affecting employees, operating cost studies, public relations with particular reference to favorable impressions upon users of service, the co-ordination of all types of transportation, and other social and economic problems that pertain to railroading.

The cost of centralized research should be small for some time, as it would require several years to build up an adequate research staff. Considerable waste, no doubt, is involved in the present duplication of research effort and the committee system of supervision, the elimination of which would result in savings that should be sufficient to start a high grade central research laboratory. There is also a possibility that a proper co-ordina-

tion of all railroad research work would result in less misdirected effort by equipment manufacturers, which is paid for indirectly by the railroads.

Relatively Little Co-operative Research

Of the 6¼ million dollars that has been spent by the railroads co-operatively for research during the last 11 years through the A. R. A., more than 2¼ millions was expended for the investigation of power air brakes, leaving less than 4½ millions for the other types of research, testing and standardization. With railway operating revenues of nearly 53 billion dollars during the period from 1923 to 1933, the railroads have devoted collectively only about one-hundredth of one per cent of their operating revenues for the creation of new knowledge, as compared with expenditures of one to four per cent for research in the case of progressive industries. The American Telephone & Telegraph Company reports an average annual expenditure of \$8,700,000 for research, even during the past four years of depression, with a gross revenue of only about one billion dollars per year, while the Aluminum Company of America has been devoting 1 to 4 per cent of its gross income for research. These industries consider expenditures for research as the insurance which their companies must take out in order that their products and services will not only continue to show improvement year by year, but be more adaptable to the changing needs and desires of the people served. Any industry which does not take advantage of new knowledge and is not constantly searching for new developments is bound to lose in its competition for sales or services.

In advocating more effective centralized research and greater expenditures for the creation of new knowledge I am not unmindful of the splendid contributions of the American Railway Association, the equipment manufacturers and the individual railroads. So far as they have gone the results have been excellent, but railroad research, particularly of the basic type, has not been carried out on a scale which its importance deserves. Too large a proportion of past research efforts have probably been directed to old problems and too little to those of the future. Intelligent anticipation of a new problem will often change the course of events and may forestall unfavorable developments. A well-balanced and energetic program of basic transportation research will pay big dividends in the practical results secured.

In the past, government regulation has been responsible at least in part for the failure of railroads to make long time plans. The many uncertainties which have surrounded railroad financing and management have made it of necessity a hand-to-mouth industry. Let us hope that the forward-looking program of the United States government will remove some of the past handicaps and will fully justify American railroads in utilizing more research in long time planning. Let us hope that greater attention to railroad research will definitely improve the financial condition of the railroads, enhance their place in the transportation fabric of the country, and benefit the public through the furnishing of cheaper, safer and better rail transportation.

THE LEIPZIG FAIR has just closed the largest and best-attended session in several years, according to a recent announcement. The report shows an attendance of 150,000, an increase of 35 per cent over last Spring's fair. Sales in many divisions showed a marked increase, the report continues, with the volume of business transacted at the general sample fair 30 per cent ahead of last year, and that at the technical fair showing an increase of 50 per cent.

An Outline of the Co-ordinator's Functions

WASHINGTON, D. C.

CO-ORDINATOR Eastman on April 3 issued a statement in the form of questions and answers prepared in response to many general inquiries as to the functions and organization of the federal co-ordinator of transportation, as to which there has been the most widespread and profound misunderstanding ever since he was appointed to the position last June. While much of the material is not new to those who have followed his activities and reports, some of the answers to questions give a more up-to-date picture of some of the investigations which his organization has undertaken, and which are now drawing to a close, than has heretofore been available.

The Section of Legislative Research has assisted the Co-ordinator in the study and investigation of matters which have a bearing on the need for further transportation legislation. These relate chiefly to railroad consolidation plans, regulation of transportation agencies other than railroads, and needed changes in existing laws applicable to transportation agencies.

Section of Transportation Service

The Section of Transportation Service has undertaken four major surveys: The Merchandise Traffic Survey, the Passenger Traffic Survey, the Carload Traffic Survey, and the Marketing Survey. The first of these has been issued.

The Passenger Traffic Survey has five objectives: (1) to determine the causes for the increasing losses of passenger patronage by the railroads, (2) to ascertain the relative efficiency from service and economic standpoints of the various passenger-carrying agencies, (3) to measure the potential market for railway passenger service, (4) to investigate means by which railroad passenger service may be more economically operated, so that charges to patrons may be lowered accordingly, and (5) to devise methods by which the various passenger agencies may be more effectively co-ordinated.

The Carload Traffic Survey has seven objectives:

1. To determine the volume, the origin and destination of available traffic (by principal commodities), and the distribution thereof, between the several transportation agencies.
2. To analyze the methods, practices, service and costs of the terminal operations of each transportation agency; survey the extent and character of terminal facilities; and determine the economic utility of each.
3. To analyze the facilities, methods, practices, service, and costs of line-haul operations of each agency and determine their respective economic utilities.
4. To determine the relative utility of equipment units, presently and potentially available, with respect to dimension, capacity, minimum loads, convenience, and economy in loading and unloading, and protection of the lading while enroute against the elements, vibration, shock, and loss.
5. To ascertain the service needs of shippers with respect to facilities, equipment, speed, and completeness of movement.
6. To determine the extra transportation expense incurred by the shippers in (a) furnishing and maintaining sidings, platforms, docks, etc.; (b) packing, crating, billing, etc.; (c) drayage.
7. To study the present and potential economic relationship between carload charges and transportation costs with respect to the various kinds of traffic.

In the Marketing Survey, investigation and analysis will be made of the form, duties, and nature of the traffic organizations of representative systems, their sub-departments and subdivisions, and also common or joint agencies and bureaus. Investigation will be made of the rate-making machinery, to see if further means of sim-

plification and of economy in pricing procedures and methods can be found. Methods and costs as well as regulatory requirements in compiling, checking, revising, printing, and publishing tariffs will be analyzed and examined, with a view to making tariffs more intelligible to patrons and less expensive to carriers. Methods of selling transportation, of soliciting traffic, both by central office representatives and by on-line and off-line commercial agencies, will be examined. Personnel, costs, sales efforts, methods of control, productivity, and market possibilities will be reviewed. Advertising policies and media will be examined, particularly with respect to the substitution of advertising in part for direct sales efforts. Finally the need and potentialities of market research and development by carriers individually and in co-operative groups will be explored.

The function of the Section of Car Pooling is to determine whether it is feasible and desirable to extend the principle of pooling to all or any class of equipment, and also to consider alternative means of reducing empty-car mileage and other questions arising in connection with the use and maintenance of equipment.

Section of Purchases

The general purpose of the Section of Purchases is to promote economy in the selection and procurement of railroad physical property. Its work has been primarily directed toward:

1. *Standardization and simplification.*—Reduction in variety of specifications, designs, types, sizes, and other features of physical items and in variety of methods and practices, and concentration on the smallest number of different items required for adequate performance. Determination of the best available designs, considering both technical and commercial factors, for those items which are selected as standard. Establishing standards in effective use, and maintaining their effectiveness by periodic review to determine the need for modification to meet changed conditions.

2. *Improvement in purchasing methods.*—Studies of means for eliminating wasteful practices, such as reciprocal buying, uneconomical routing of railroad material, and selection of material without adequate knowledge or consideration of ultimate economy.

The studies directed toward these ends have shown the need for adequate carrier organization for:

3. *Investigation of new materials, devices, and methods.*—This involves study of means of improving performance. Such means include new inventions and developments, improved designs, improved methods of performing physical items and methods successfully used in other industries. The section is not itself equipped for such investigation, and the funds of the Co-ordinator are insufficient to establish an adequate staff for this purpose. It may be possible to do something with the help of members of the Commission's staff, but the main hope is of promoting an adequate carrier organization for such work.

Wages and Labor Relations

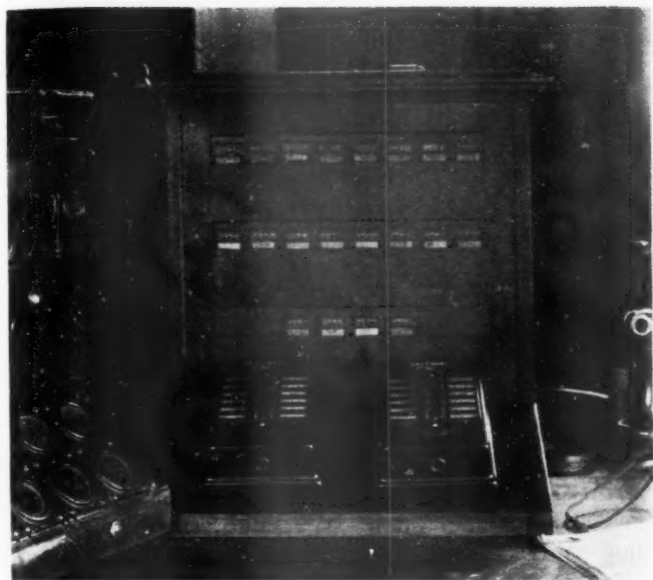
To the questions: "Has the Co-ordinator any authority over wages or working conditions of railway employees?", and "Does the Co-ordinator have authority to adjust disputes or questions of discipline between a railroad and its employees?", the answer is given: "No."

As to the action taken in regard to "company unions," it is stated that "the indications are that substantial progress has been made, and that further progress will be made, toward the correction of this situation." It will be closely watched and checked, however, by the Section of Labor Relations.

It has been made clear by the Co-ordinator in all his communications in regard to this matter that so-called "company unions" are not outlawed by the statute. The prohibitions, he says, are intended merely to ensure to employees absolute freedom of choice with respect to labor organizations, and to prevent the carriers from interfering with such organizations in any way, or with

(Continued on page 552)

An Automatic Wheel Counter on the Union Pacific



Counter, Located Near the Interlocking Machine

AN automatic wheel counter has been installed at the Union Pacific bridge over the Missouri river at Omaha, Neb. This bridge is owned by the Union Pacific and, in addition to the trains of this road, carries those of eight other railways, including the North Western, the Rock Island, the Milwaukee, the Illinois Central, the Chicago Great Western, the Wabash and the Burlington. Since the charges for the use of the bridge are made on a wheelage basis, two men were previously located at the west end of the bridge on each trick to count and record the number of wheels in each train, as well as the name of the road operating the train. The new automatic wheel-counting system was installed to secure an absolutely accurate count, and permit these six men to be transferred to other duties, thus reducing operating expenses.

Design of the System

This automatic wheel-counting system was developed, constructed and installed by signal department forces of the Union Pacific. Each counting device consists of a Union Switch & Signal Company light-signal counter, which includes a counter actuated by a small electro-magnet and armature. Twenty of these counters are mounted in a neat oak cabinet located on the operator's desk near the interlocking machine in the tower near the east end of the bridge. These counters are actuated by circuits which are completed when a set of car wheels and their axle pass over short insulated sections of track, one such track section being located in each of the four tracks extending eastward from the interlocking.

Because trains of nine roads use the main tracks, the first problem was to devise a selector system that would set up separate counters to operate for trains of each road.

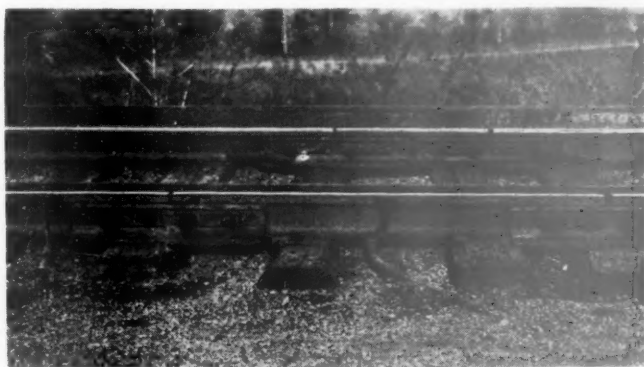
Furthermore, the eastbound trains must be counted separately from west bound trains. As a further complication, Chicago Great Western freight trains take a different route after leaving the west end of the bridge and, therefore, must be counted separately. Two tracks

Charges for use of bridge are made on wheelage basis and are calculated from record made by automatic counter operated by short rail sections in the tracks

extend across the bridge to the interlocking at the east end, at which point two tracks, used principally by the Union Pacific, branch off. Therefore, in order to check all the operations, it was necessary to count the trains on each of the four tracks. To include all the various factors as to roads, tracks, and direction of movements, a total of 20 counters were required. The top row of counters in the cabinet is for westbound trains and the second row for eastbound trains, one counter in each row being used for each of the eight roads other than the U. P. The third row has four counters, one for C. G. W. freight trains westbound, another for C. G. W. freights eastbound, a third for U. P. track 3 and the fourth for U. P. track 4.

Selector Control

Having devised a system of counters and a method of operation to meet the requirements, the next step was to provide a selector control to use the four rail-control layouts to get the 20 selections as to roads, direction, etc. It was decided that 12-way Graybar interphone push-button selectors could be readily adapted to meet the requirement. Two of these selectors—one for eastbound and the other for westbound trains—are used, and are mounted as shown on the desk just in front of the



The 28-in. Section Is in the Rail on the Far Side

counter cabinet. The operator either has advance information as to the identity of approaching trains, or he can identify them as they approach within his range of vision. He then pushes the button on the selector marked for the road and direction. This sets up the circuit so that the circuit on the track will operate the correct counter. When the button is pushed down, it auto-

matically breaks down the previous set-up and, as the button sticks down, it automatically locks out any other set-up for the same direction.

In order to be sure that no train passes through without the counter control being set up, the home signal control circuits are controlled through stick relays that are picked up when the button on the counter selector is pushed. Therefore, before the leverman can clear the signal, he must first set up the counter control. When the train enters the plant, the stick relay is dropped, so that the leverman must again set up the counter control before clearing the signal for another train.

The short rail circuits which actuate the counters consist of a rail section 28 in. long on one side of the track and a section about 6 ft. long in the other rail. It was determined by measurements and tests that a 28-in. section of rail is correct to secure proper operation of the device for six-wheel trucks such as are used on passenger-train equipment. Although train speeds are limited in this area to 25 m.p.h., the counter will work satisfactorily for train speeds up to 45 m.p.h. For higher speeds, the coils of the counters would have to be re-wound to secure quicker action. The insulated section on the opposite rail can be the same length or longer, and on this installation the sections are from five to six feet long, the idea being to get the joints on ties other than those used for the joints of the shorter section on the opposite rail. The regular track circuits are jumpered around these short sections.

From a track viewpoint, it is agreed that it is not desirable to have in service rail sections as short as 28-in. However, consideration is given to the fact that train speeds are limited to 25 m.p.h. through this interlocking and over the bridge. Where higher speeds obtain, it would be practical to secure sections of angle bars long enough to extend throughout the 28-in. section, with joints at the ends, the entire section being insulated.

The counter counts up to 9,999, and each night, at midnight, the operator on duty makes a record of the number displayed on each counter. From these records the wheel reports are made up, and the charges to each road are based on these reports.

* * *



A Boston & Maine Train near Winchester, Mass.

Report on Collision at Atlantic, Mass.

A REAR collision of passenger trains on the New York, New Haven & Hartford, at Atlantic, Mass., about five miles south of Boston, on November 29, was in some features unique, and the report of the Interstate Commerce Commission concerning it, which is dated February 14, gives a detailed explanation of the cause; some explanation of why the disaster was not a greater one, and a comparison with the collision on the Erie, at Binghamton, N. Y., on September 5.

The collision occurred at 8:24 a.m. on a clear day. Northbound passenger train No. 642, eight coaches fully loaded, had been stopped at signal No. 36L because of the drawbridge over Neponset river being opened; after about five minutes, it was run into at the rear by northbound passenger train No. 646, with nine coaches fully loaded, which was moving at somewhere from 25 to 45 miles an hour. The rear car of No. 642 was crushed for several feet and minor damage was sustained by all the other cars in the train. The locomotive of No. 646 was damaged in front, and the first car overrode the frame of the tender, dislodging the cistern. The fireman of No. 646 was killed, and the engineman and two trainmen were injured; the two trains were carrying nearly 1300 passengers, and of these 204 were reported injured.

Train 646 had started from Braintree, about four miles away, at 8:10 a. m., on time, and only one minute behind No. 642 (the trains were scheduled to leave Braintree two minutes apart, but the second train made several stops, so that at Atlantic, the time-table shows them five minutes apart). Train 646 had passed two caution signals and a stop signal (38L) set against it, and also had passed the flagman of No. 642, who was about 550 ft. in the rear of his train. The flagman said that his signals were not answered, and the engineman said that he had not seen the flagman; he had applied the brakes only a very short distance before striking the standing train.

The engineman of No. 646, having been injured, was not interviewed until December 20. Because of a curve of three deg. to the left, he had depended on the fireman to observe the signals, and he said the fireman, with his head out of the window, had called "all right," at the usual place for signal 38L.

The report, placing the responsibility on the engineman of No. 646, says that this man was on his regular run and was thoroughly familiar with the conditions at this location. He had observed the two approach signals and knew the rule requiring him to limit his speed to 25 miles an hour after passing the second one. Yet, he was unable to stop after having seen the stop signal about 450 ft. away. All five members of his train crew, as well as other experienced employees, estimated his speed as much higher than the engineman acknowledged. All the cars in train No. 646 were equipped with P C brake equipment, which can produce 180 per cent braking power. A competent witness testified that the train passed the flagman at about 35 miles an hour, the engine working steam.

Regardless of the value of the engineman's statement that the fireman miscalled the signal indication, the engineman is held responsible because of excessive speed, and his not seeing the flagman.

These "rush-hour" suburban trains, says the report, scheduled only two minutes apart, impose a special duty

on employees to be alert at all times and to comply strictly with the rules; and in this connection, the flagman of No. 642 is held to have been slow in getting back, he having been engaged in taking tickets some distance away from the rear car. If he had been on the rear car, ready to start back, he probably would have been able to give a signal which would have been acted upon by the men on the engine of No. 646.

All passenger cars on the New Haven road are of steel, except 25 with steel underframes, eight of which composed train No. 642. These cars have anti-telescoping steel vestibules and, although occupied by 515 passengers, very few of these were seriously injured, and no one was killed. This, says the report, was in marked contrast with the case at Binghamton, where the colliding train was probably moving not any faster than in the present case. In the Erie case, the seventh car telescoped the sixth, resulting in the death of 14 passengers and the injury of many others; but the Erie cars with steel underframes did not have anti-telescoping steel vestibules. Had the New Haven cars not been well-built, with this substantial end construction, it is probable that the casualties would have been much more serious.

Strengthening of Demurrage Bureaus Recommended

WASHINGTON, D. C.

COORDINATOR EASTMAN on April 5 submitted to the Regional Co-ordinating Committees for study and action a memorandum prepared at his request by W. P. Bartel, director of the Bureau of Service of the Interstate Commerce Commission, containing recommendations designed to secure better supervision of the application of demurrage and storage rules throughout the country. Mr. Bartel was assisted in his study by W. V. Hardie, director of the commission's Bureau of Traffic, and W. H. Bonneville, director of its Bureau of Inquiry, and they concur in his recommendations. These have also been approved by the Co-ordinator's three traffic assistants, Messrs. Chandler, Hochstedler, and Caskie.

Substantial Net Savings Seen

Briefly, Mr. Eastman said, these recommendations propose to strengthen and supplement the demurrage bureaus now maintained by the carriers collectively, so that they may perform more effectively the duties which such bureaus should perform. It is believed that this will result in a substantial net saving to the carriers.

"That these rules are not uniformly applied probably would not be disputed," Mr. Bartel said. "If it were, the files of this Bureau contain sufficient evidence adequately to support the statement, demurrage and storage complaints filed with the commission being referred to us.

"There are two reasons for this lack of uniformity. One is that so much necessarily must be left to the fidelity, judgment, and knowledge of the rules of so many different carrier employees, yard clerks, conductors, station agents, clerks, etc., with respect to controlling facts, adequacy of records, and interpretation of rules. The other reason is that the responsible representatives of carriers may be reluctant to have the rules enforced because of fear of diversion of business by disaffected shippers. This extends also into the realm of claim

settlements." Following is a condensation of the memorandum:

Failure uniformly to apply the rules of the tariff, both as to demurrage and as to storage, may not only be in violation of section 6, but also of section 2 and/or section 3 of the Interstate Commerce Act—and in some easily conceivable circumstances, of the Elkins Act, also. The situation is serious and the need for correction is great.

Demurrage and storage bureaus may be considered under two general headings, (1) detail bureaus, and (2) inspection and adjustment bureaus.

Detail bureaus receive complete original records of demurrage and storage transactions from every station within their respective jurisdictions, check these records, revise them for undercharges, overcharges, and other irregularities, and handle discrepancies for correction. All disputes and claims pertaining to demurrage and storage are investigated and disposed of by the bureaus, and no refunds or cancellations are made by member carriers except upon bureau authority.

In addition to the functions outlined, each bureau of this type maintains a corps of auditors or inspectors who visit the stations, check the application of the rules, and instruct carrier employees with respect to correct practice under the demurrage tariff.

Inspection and adjustment bureaus handle, or should handle, authoritatively, all disputes and claims pertaining to demurrage and storage, disposing of these upon their merits without interference by interested carriers; no refunds or cancellations being made by such carriers except upon bureau authority. The same close inspection and supervision of the application of demurrage and storage rules at stations should be maintained by this type of bureau that is made effective by the other, and the same kind of instructions should be given carrier employees charged with responsibility for administering the rules. Obviously, the office force of the inspection and adjustment type of bureau is less extensive and less expensive than that of the detail type.

Recommendation

I now recommend that the subject be referred to the three regional co-ordinating committees with the definite objective of—

(A) Securing for the three detail-type bureaus, Pacific, Inter-mountain and Southeastern, the few additional inspectors needed to enable them adequately to police their territories;

(B) Securing for the three present bureaus of the inspection and adjustment type, New England, Trunk Line and C. F. A., and Western, (1) adequate authority to handle and adjust disputes, with exclusive authority over refunds and cancellations, and (2) such increase in office force as may be needed to make their work effective, and such additional inspectors as are necessary to the adequate policing of their jurisdictions; and

(C) The establishment of one additional inspection and adjustment type bureau and a redistribution of western territory as follows: *Western Trunk Line Bureau*, Upper Peninsula of Michigan, Wisconsin, Illinois, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas; *New South-western Bureau*, Arkansas, Louisiana, Oklahoma and Texas; *Intermountain Bureau*, Montana, Idaho, Wyoming, Nevada, Utah, and Colorado; *Pacific Bureau*, Washington, Oregon, California, Arizona, and New Mexico. The division of jurisdiction as between Western Trunk Line and Southwestern territories is that suggested by Director Hardie.

This redistribution plan is somewhat like that suggested by the American Railroad Association in 1920, when that organization proposed that the country be divided into seven zones, each under a demurrage and storage bureau. The present Western bureau, with headquarters in Chicago, now has jurisdiction over some 18 states—an impossible situation.*

An "enlightened guess" as to the additional annual expenditure necessary to cover the expense of this rearrangement and addition is \$30,000 per annum, and Mr. Thomason (A. G. Thomason, demurrage commissioner for New England) in reply to your inquiry, said on this point: "It is almost a certainty that whatever the additional cost, it would be more than covered by increased collections. . . ."

Regarding this feature, I said in my memorandum to you under date August 28: "As for the cost, it is my feeling that increased demurrage collections would probably meet this."

The basis for this is the fact that even as a result of the necessarily limited character of the checking done by our own service agents, literally many thousands of dollars in demurrage charges have been collected by carriers that but for such checking, would never have been assessed.

That there are large incidental savings to be effected by the proper enforcement of the provisions of the demurrage tariffs

* The recent merging of the Western Demurrage & Storage Bureau in the Western Weighing & Inspection Bureau, with the manager of the former as assistant manager of the latter is, in these circumstances, illuminating.

is also true. Country-wide efficiency in this respect would save the carriers much money through a material contribution to car supply; through increased opportunity for the orderly use of terminal facilities; and by the attendant opportunity for minimizing switching and related expenses.

Before the abandonment of the old-line demurrage and storage bureaus, there were 36 of these in operation, but they were of the detail type, and necessarily could not handle as extensive territory individually as can be covered satisfactorily by the simpler form of bureau.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 31 totaled 608,443 cars, a decrease of 19 cars as compared with the week before but an increase of 110,087 cars as compared with the corresponding week of last year and of 63,482 cars as compared with 1932. Coal and coke were the only commodity classifications to show increases as compared with the preceding week, but merchandise, forest products, ore, coal and coke showed increases as compared with 1933. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, March 31, 1934

Districts	1934	1933	1932
Eastern	143,887	114,866	126,365
Allegheny	123,061	92,944	108,624
Pocahontas	48,134	32,091	32,278
Southern	95,881	80,417	86,299
Northwestern	67,398	57,613	63,374
Central Western	82,249	75,024	82,322
Southwestern	47,833	45,401	45,699
Total Western Districts	197,480	178,038	191,395
Total All Roads	608,443	498,356	544,961
Commodities			
Grain and Grain Products	27,512	34,327	29,176
Live Stock	13,541	14,870	16,203
Coal	138,558	89,120	94,781
Coke	7,624	3,767	4,408
Forest Products	23,962	17,273	19,186
Ore	4,199	2,661	2,183
Merchandise L.C.L.	166,125	159,575	186,489
Miscellaneous	226,922	176,763	192,535
March 31	608,443	498,356	544,961
March 24	608,462	479,959	561,118
March 17	625,773	453,637	584,759
March 10	612,402	441,361	573,481
March 3	604,137	481,208	559,479
Cumulative total, 13 weeks	7,545,648	6,249,295	7,335,790

Car Loading in Canada

Car loadings in Canada for the week ended March 31 totaled 38,512 cars, according to the compilation of the Dominion Bureau of Statistics. The holiday on Good Friday, March 30, was the chief factor in causing the reduction from the previous week of 3,801 cars. Compared with last year's loadings the total was higher by 3,928 cars despite the holiday being three weeks later in 1933.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
March 31, 1934	38,512	25,061
March 24, 1934	42,313	25,050
March 17, 1934	43,612	26,007
April 1, 1933	34,584	17,994
Cumulative Totals for Canada:		
March 31, 1934	529,791	298,552
April 1, 1933	430,799	221,876
April 2, 1932	535,333	282,024

An Outline of the Co-ordinator's Functions

(Continued from page 548)

the employees in their choice, and from using carrier funds to maintain company unions.

Some of the other investigations and special studies undertaken by the Section of Labor Relations are as follows:

1. Labor relations on the railroad-controlled refrigerator car lines, railway express companies, and the Pullman Company have been investigated and data secured for use by the Co-ordinator in connection with existing and proposed legislation affecting the labor relations in these transportation agencies in their bearing on the entire railroad industry.

2. A survey of minimum wage rates and maximum hours of the lower paid employees in the railroad industry is nearing completion. This survey is intended to enable a comparison of the wage rates and hours of railroad employees with the wage rates and hours of those employed in other industries whose minimum hours have been established by codes under the National Recovery Administration.

3. The Section of Labor Relations in conjunction with an Advisory Committee composed of specialists in the field of industrial relations, social security, and human problems in industry has been engaged in an extensive study of plans designed to provide reasonable security for railroad employees who would otherwise be adversely affected by technological improvements, coordination of railroad facilities and services, or even mergers and consolidations.

4. The Section is also making an analysis of the various elements of cost and the reasons for such costs resulting from certain types of rules incorporated in working agreements between the railroads and labor organizations, particularly in train and engine service. This investigation will also embrace the operating practices of the railroads as a result of which these rules were originally devised.

5. Another inquiry of importance now being undertaken by the Section is for the purpose of securing data concerning railroad expenses arising from occupational accidents to employees. This data is necessary in connection with legislation which is now pending in Congress seeking to extend the principle of accident compensation to all railroad workers in the country.

As to whether the railroads are subject to the provisions of the National Industrial Recovery Act the answer is:

In August, 1933, the question was presented by the Railway Labor Executives' Association to the President, whether the railroads were subject to the provisions of the National Industrial Recovery Act. They expressed the opinion that the railroads were subject to these provisions, and that a code should be established for them. At the request of the President, the Co-ordinator submitted a memorandum upon this question, in which he reached the conclusions that the National Industrial Recovery Act was not as a matter of law applicable to the railroads, and that the adoption of a code for them would not be wise, even if it were legally practicable. The reasons for these conclusions were given at length. The President, in a letter which he subsequently sent to the chairman of the Railway Labor Executives' Association, stated that he found himself "largely in agreement" with this memorandum.

A question: "Does the Co-ordinator have authority to require that equipment of a carrier be repaired in a particular shop or that a particular shop be continued in operation or reopened?" is answered as follows:

The Co-ordinator has such authority only in instances where it can be established that the economy of operation by the carrier would be increased by such action.

It is also pointed out that one of the purposes of the act, "to promote financial reorganization of the carriers," is not reflected in any duty imposed upon the Co-ordinator, but in the direction to the Interstate Commerce Commission in section 15. This provides that the Commission "shall not approve a loan to a carrier under the Reconstruction Finance Corporation Act, as amended, if it is of the opinion that such carrier is in need of financial reorganization in the public interest."

Communications . . .

Salaries of Minor Officers

TO THE EDITOR:

I refer to the article on page 309 of the *Railway Age* for March 3, entitled, "Shall (Railroad) Careers Be Closed to Talent?" The author of that article is in my opinion inclined to be unfair in dealing with this situation, or else he is ignorant of the facts. In my opinion Co-ordinator Eastman's action with respect to salaries paid the executives was due entirely to the executives' niggardly attitude toward the minor officers, with respect to both salaries and expense accounts.

You may be surprised to learn that the salary of a minor officer of one of the A-1 carriers, who has charge of both rates and solicitation, is less than \$350.00 a month, and that following the crash of 1929 his salary was reduced twice, and on the same percentage basis as the executives' salaries before Mr. Eastman demanded a further reduction in the salaries of the executives.

You state that to reduce too much the number and size of the large prizes to be won, will inevitably reduce the intensity of the competitive efforts made by able men to win them, and in this connection I am just wondering if you realize how few of the great number of employees ever win one of these large prizes, or ever hope to win one of them. Climbing the rungs of the ladder of success is a long journey, but ample remuneration shortens the miles, and the sooner the railroads place in the executive positions men who possess leadership and vision the sooner this situation will be corrected, as they will know that the management of a railroad is not a one-man job.

I am, therefore, of the opinion that adequate salaries for the minor officers would attract more talent than would the few large prizes to which you refer.

DUCE OF THE OLD DEAL.

Locomotive Engineers Commended

CHAMPAIGN, ILLINOIS.

TO THE EDITOR:

I was interested in your item, "Co-ordinator Overlooked a Bet," in the "Odds and Ends" department of the *Railway Age* for February 24, 1934.

I have read many articles about the wonderful train handling by engineers in England, France and even in Mexico as compared with the United States and as yet I have never seen anyone come forward in defense of our engineers in this country.

Prior to looking over the "Royal Scot" on its visit to the Century of Progress last summer, I wondered why there should be so much difference in the train handling in this country and in France, England and other countries. After inspecting this train, I find there is no need for anyone to wonder at the difference in handling. All the slack being taken up between the cars, also between the cars and engine of the "Royal Scot," makes it possible to start the train as a unit and it would be impossible to start it roughly if the engineer wanted to.

I have been connected with engine service for the last 33 years and it is my opinion that engineers in the United States are second to none in the world and it is a pity that someone has not defended them before this. Our trains and locomotives are heavy, there is more or less slack between each and every car, and it requires an expert on the head end to handle the heavy steel trains, making the time and the fast stops, and avoid rough handling.

The engineers in this country deserve credit rather than condemnation for the manner in which they handle our trains. I do not think that our engineers could learn anything by going to England to observe how English engineers handle their trains; neither do I believe that England could send any engineers over here who could teach our engineers anything about handling the steel passenger trains in this country.

We have the finest passenger trains in the world, with no exception, and our engineers take wonderful pride in the handling of these trains, and, as I said before, they should be given credit for what they do.

W. P. BUCKLES,
Traveling Engineer, Illinois Central.

Odds and Ends . . .

Railway Exhibit at Auto Show

It was almost an instance of the lion and the lamb lying down together when the German railroads installed an exhibit at the 1934 International Automobile Exhibition, held in Berlin-Charlottenburg. The exhibit illustrated the progress which has been made in motorizing the railway and also methods of co-ordination between trains and motor trucks. The increasing employment of internal combustion engines on the railways was shown by an exhibit of some 15 to 20 motors of small locomotives, ranging in horsepower from 30 to 420.

Another Conscience Goes to Work

Always intrigued by the workings of the human conscience, this department has published numerous stories about contributions to the "conscience funds" of railway. Usually these contributions are in the form of money, but the Missouri-Kansas-Texas was recently reimbursed in a different way. One day last month, the station agent at Knowles, Okla., received, on behalf of the railway, two lengths of iron pipe, one about 20 ft. long and the other about 10 ft. long. The man who brought them confessed that they were the property of the railroad and explained that he had taken the pipe from the right-of-way eight or ten years ago. Recently the man had "got religion" and could not rest until the pipe had been returned.

Father and Two Sons on Pension Roll

A father and two sons, all retired after many years of service, are now enrolled in the Pennsylvania pension department, and the case is believed to be the first of its kind not only on the Pennsylvania but anywhere in the country. The three retired employees are Joseph Davis, the father, and his two sons, William and Milton. Joseph Davis retired on January 1, 1912, at which time he was master mechanic of the Middle division, after 48 years, 8 months of service. His son, William, was retired on November 1, 1931, when he was assistant foreman of the reclamation shops at Chambersburg. At that time, he had completed 49 years, 5 months of service. The second son, Milton, a draftsman at the Altoona Works, retired on March 1 of this year after 46 years, 6 months of service.

Record for Long Platforms?

As a result of the completion of the extensive program of improvements at Paddington, passenger terminal of the Great Western Railway in London, England, the station now has a greater total length of platforms than that of any other station in Great Britain, except Victoria. Paddington's platforms now aggregate 15,030 ft., or nearly $2\frac{3}{4}$ miles, in length. In addition, two platforms, used chiefly for "parcels" traffic, measure 1,511 ft. in length. The three main departure platforms are each over 1,100 ft. in length, but the longest platforms are Nos. 8 and 9, which are 1,200 ft. long. This department is curious to know how the Paddington platforms stack up in length in comparison with those in this country. We shall be glad to hear from our well-informed readers on this point.

Good Advertising Stunt

During the past winter, many people received letters from the St. Louis-San Francisco, and it is a safe guess that plenty of interest was aroused. The reason for the special attention attracted by these letters was the fact that each had attached to it a small envelope containing white sand from Miami Beach, Fla. The accompanying letter started in this way: "This small envelope of sand is all of Miami Beach that we can bring to you. But for only \$61.50, we can take you from Kansas City to Miami Beach and return, on the only direct line between Kansas City and Florida—the Frisco." The letter and its enclosure were part of the extensive Florida advertising campaign carried on by the Frisco during the winter, which helped the Frisco to get 50 per cent more passenger business to Florida points this year than last year.

NEWS

Regional Boards to Review Purchases of the Railways

Purchases and Stores Division general committee approves proposal in that connection

The general committee of the Purchases and Stores Division, American Railway Association, has approved a recommendation developed by a special committee of the division, regarding a plan proposed by the section of purchases in Co-ordinator Eastman's organization, to review all purchases made by the railroads. After a trial period, as provided in the recommendation, a final plan will be submitted to the regional coordinating committees.

The plan contemplates the establishment of regional reviewing boards composed of railroad purchasing officers. The railroads in each region will be requested to send to the regional reviewing board one copy of each purchase order issued. Each order will show a description of the material ordered, routing of the material from the vendor to the point of delivery, and price of the material. Items which conform to A. R. A. standards will be identified.

Each regional board is expected to meet once a month to review orders issued up to the end of the preceding month. A representative of the section of purchases will attend each meeting and co-operate with the board in its work. Each board will have a secretary or clerk who will sort, classify, and tabulate the orders as received. The number of purchase orders which would be regularly reviewed by each board would probably not exceed 500 per month, unless the reviewing board deemed it advisable to review all orders for a given commodity or class of material, regardless of quantity or price. After each meeting of a regional reviewing board, all purchase orders received since the previous meeting will be sent to the co-ordinator's office in Washington for such further study as may be found desirable.

"It is believed that such review of purchase orders will result in direct benefit to the railroads individually and as a whole," Mr. Eastman said, "since the information developed therefrom will furnish accurate and detailed information regarding current prices and price trends, and will be useful in promoting the application of A. R. A. standards. It should also disclose possibilities for more economical routing of materials from the source of supply to the point of delivery on the railroad.

"This plan has been under consideration for some months, by railroad purchasing officers, equipment and supply manufac-

Supervision of Union Balloting?

Mr. Eastman proposes that in organizing employee unions a majority shall speak for all. It is manifest that this will give union electoral processes a great public importance. Can these processes be left unregulated or unsupervised, or must we take precautions similar to those we employ in connection with our political machinery? That is likely to be a thorny point of debate. But the "public interest" in the matter is both large and evident.

Thomas F. Woodlock in Wall Street Journal.

turers, and representatives of the section of purchases. The special committee of the Purchases and Stores Division has made a careful study of the plan as proposed, and the general consensus of opinion is that it will develop a quantity of useful information which could not be secured by any other means. In order to get the plan into operation, it is now recommended that the present special committee act as the first reviewing board, with headquarters in Chicago, and that certain railroads in that region be requested to send in copies of all their purchase orders during a trial period. The committee, with the co-operation of the section of purchases, will then undertake to develop detailed operating plans which will be practicable and as economical as possible.

"In order to equalize the work of the reviewing boards, it appears probable that the railroads should be grouped into seven regions, with reviewing board headquarters in New York, Cleveland, Atlanta, Chicago, Omaha, St. Louis, San Francisco. It has been proposed that the chairmen of the regional boards constitute a national reviewing board, which would meet with representatives of the co-ordinator at such intervals as might be found desirable, for the purpose of considering purchasing problems of national scope."

Rivers and Harbors Bill Reported

The House committee on rivers and harbors has favorably reported a river and harbor authorization bill approving projects of which the total estimated cost is approximately \$195,000,000. These include the proposed improvement of the New York state canal system, \$27,000,000, and the canalization of the Beaver and Mahoning rivers, at an estimated cost of \$37,000,000. It is understood that final action on the bill may not be taken at this session of Congress but approval by the committee of the projects will put them in a status where the Public Works Administration may advance funds for them.

Southern Asks Extension of Low-Fare Experiment

Withdraws from parleys in connection with prematurely-announced rail-bus accord

The Southern has applied to the Interstate Commerce Commission for fourth section authorization to enable it to continue for an additional six-months period its experiment with coach fares at a cent and one-half a mile which were put into effect on December 1 for an experimental period expiring May 31. This action was taken by the Southern in spite of the efforts being made by the bus operators and N.R.A. officials to bring about an agreement, which the N.R.A. prematurely announced last week, between the southeastern railroads and the bus operators for the maintenance of a two-cents-a-mile minimum. A number of the southeastern roads had indicated a willingness to enter into such an agreement but the Southern had withdrawn from the discussions.

The National Recovery Administration has announced a hearing to be held on April 20 at Washington on a modification proposed by the Motor Bus Code Authority in the provision of the motor bus code relating to the maintenance of published rates, to provide for the adoption by the code authority, upon approval of the administrator, of agreements covering tariffs of rates, fares, and charges between passenger motor carriers and "carriers of passengers by other forms of transportation subject to governmental regulation or supervision."

In the petition, filed on behalf of the railways in the Southern System by C. B. Rhodes, chairman of the Southeastern Passenger Association, it is pointed out that the present experiment has not been in effect sufficiently long to determine the propriety of making it permanent but that the results "constitute the first ray of light on the passenger horizon in many years." It is declared that "the experiment has proved successful so far, and it is the hope and desire of petitioners that same be continued throughout the remainder of the year."

"It is their desire and purpose to transport passengers at fares that will attract business and at the same time prove profitable. If the experimental fares accomplish this result they should be continued regardless of whether the same fares meet the requirements of carriers operating in other localities or are suitable to the operators of other forms of passenger transportation."

(Continued on page 559)

Two Months Rail Net a 1.99 Per Cent Return

Total of \$60,209,882 compares with \$23,718,787 or 0.78 per cent last year

Class I railroads for the first two months of 1934 had a net railway operating income of \$60,209,882, which was at the annual rate of return of 1.99 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first two months of 1933, their net railway operating income was \$23,718,787, or 0.78 per cent. Operating revenues for the first two months totaled \$506,441,698, compared with \$438,709,151 for the same period in 1933, or an increase of 15.4 per cent. Operating expenses for

the first two months had a net of \$11,567,778 at the rate of 2.20 per cent. For the same period in 1933, their net amounted to \$6,060,046, at the rate of 1.15 per cent. Operating revenues in the Southern district for two months amounted to \$69,423,126, an increase of 14.5 per cent above the same period in 1933, while operating expenses totaled \$50,673,685, an increase of 6.9 per cent. Class I railroads in the Southern district for February had a net of \$6,295,413, compared with \$2,943,494 in February, 1933.

Class I railroads in the Western district for two months had a net of \$8,331,769, the rate of 0.77 per cent. For the same two months in 1933, they had a net of \$8,951,663. Operating revenues in the Western district for two months amounted to \$170,035,354, an increase of 15.7 per cent above the same period in 1933, while

CLASS I RAILROADS—UNITED STATES

Month of February

	1934	1933	Per cent increase
Total operating revenues.....	\$248,439,255	\$212,154,011	17.1
Total operating expenses.....	188,591,223	171,334,070	10.1
Taxes.....	20,571,842	21,435,328	* 4.0
Net railway operating income.....	29,281,008	10,133,777	188.9
Operating ratio—per cent.....	75.91	80.76	...
Rate of return on property investment—per cent.....	1.84	0.63	...

Two Months Ended February 28

Total operating revenues.....	\$506,441,698	\$438,709,151	15.4
Total operating expenses.....	384,440,777	353,013,827	8.9
Taxes.....	41,341,885	43,175,528	* 4.2
Net railway operating income.....	60,209,882	23,718,787	153.8
Operating ratio—per cent.....	75.91	80.47	...
Rate of return on property investment—per cent.....	1.99	0.78	...

* Decrease.

the two months amounted to \$384,440,777, compared with \$353,013,827 for the same period in 1933, or an increase of 8.9 per cent.

Class I railroads in the two months paid \$41,341,885 in taxes, compared with \$43,175,528 for the same period in 1933, or a reduction of 4.2 per cent. For February alone, the tax bill amounted to \$20,571,842, a reduction of \$863,486 under February 1933.

Forty-one Class I railroads failed to earn expenses and taxes in the first two months of 1934, of which 12 were in the Eastern district, 6 in the Southern and 23 in the Western.

Class I railroads for February had a net of \$29,281,008 which, for that month, was at the annual rate of 1.84 per cent. In February, 1933, their net was \$10,133,777, or 0.63 per cent. Operating revenues for February amounted to \$248,439,255, compared with \$212,154,011 in February, 1933, an increase of 17.1 per cent. Operating expenses in February totaled \$188,591,223, compared with \$171,334,070 in the same month in 1933, or an increase of 10.1 per cent.

Class I railroads in the Eastern district for two months had a net of \$40,310,335, at the rate of 2.85 per cent. For the same period in 1933, their net was \$26,610,404, or 1.87 per cent. Operating revenues in the Eastern district for two months totaled \$266,983,218, an increase of 15.5 per cent above the corresponding period in 1933, while operating expenses totaled \$196,340,985, an increase of 12.3 per cent. Class I railroads in the Eastern district for February had a net of \$19,172,118, compared with \$12,862,119 in February, 1933.

Class I railroads in the Southern dis-

trict for two months had a net of \$11,567,778 at the rate of 2.20 per cent. For the same period in 1933, their net amounted to \$6,060,046, at the rate of 1.15 per cent. Operating revenues in the Southern district for two months amounted to \$69,423,126, an increase of 14.5 per cent above the same period in 1933, while operating expenses totaled \$50,673,685, an increase of 6.9 per cent. Class I railroads in the Southern district for February had a net of \$6,295,413, compared with \$2,943,494 in February, 1933.

Eastman Asks Data on Inter-road Accounts

Co-ordinator Eastman has sent to all steam railroads a questionnaire asking them to report by May 1 with respect to the audit office accounts rendered by each company to, or against, all other roads, as audited in each of the months of March, June, September, and December, 1933. The information is desired for study in connection with the proposal for the establishment of a railway clearing house.

Traffic Club of Baltimore Now Has Permanent Quarters

The Traffic Club of Baltimore has recently opened permanent quarters at the Lord Baltimore Hotel, Baltimore, Md. Included among the facilities of the new clubrooms is a library, which has been assembled under the direction of the Club's librarian, J. B. Wilkes, freight representative of the Baltimore & Ohio.

Officers of the Traffic Club of Baltimore, chosen at its recent election, are as follows: President, Edward S. King, district freight agent, Baltimore & Ohio; first vice-president, R. C. Colton, traffic agent, Western Electric Company; second vice-president, Thomas E. Riley, district manager, The Export Steamship Corporation; secretary, C. F. Johnston, assistant secretary-treasurer, Locke Insulator Corporation; treasurer, J. H. Bell, freight representative, Southern Railway System.

Senate Committee Hearing on Eastman Labor Bill

Co-ordinator, the first witness heard, outlines his reasons for advocating measure

Hearings were held before the Senate committee on interstate commerce this week on the bill, S. 3266, proposed by Co-ordinator Eastman in letters to the chairmen of the House and Senate committees on March 31, as a substitute for the bill proposed by the Railway Labor Executives' Association to amend the railway labor act. Mr. Eastman was the first witness, on April 10, reading to the committee a statement outlining his reasons for advocating a revision of the labor act substantially along the lines of his letter to the two committees reported in last week's issue. He was followed on the next day by George M. Harrison, president of the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees, who strongly advocated passage of the bill, and testimony in opposition to the bill on behalf of the railroads was to be presented on Thursday by M. W. Clement, vice-president of the Pennsylvania.

Mr. Eastman said the present railway labor act has served a very useful purpose and has brought about many good results, but that experience has shown that it is in need of improvement. The proposed bill, he said, is intended to reinforce its principles and provide for their more effective application. Referring to the provisions relating to "company unions," he said he entertained no doubt that the chief reason why railroad managements prefer so-called company unions is because they can more readily influence their policies and management than would be the case with national organizations, "nor do I have any doubt as to the fact that they have in the past played a large part in both the initial organization and the subsequent operations of these company unions." However, he said, he had spent considerable time with the railroad executives on this matter, and their attitude has on the whole been very commendable. The conditions have improved very materially. The improvement has not been complete, but excellent progress has been and is being made. He did not now suggest legislation because of immediate need, but in order that the legislative situation may be clarified and stabilized and proper provision made for the future.

Discussing the need for boards of adjustment, as proposed in the bill, he said that very disturbing conditions have at times been created, especially in recent months, because of the lack of adjustment boards in many situations and the tendency of those which exist to deadlock. In at least four important instances strike votes have been taken for the purpose of creating an emergency which would justify the President in appointing a fact-finding board, so that grievances and similar controversies might be passed upon by an impartial body. He said he knew that the railroads would present very emphatic objections to the creation of a national board

of adjustment and he did not wish to dismiss their objections as of no moment, but nevertheless he believed that the experiment should be tried. "There is, I believe," he said, "no sound occasion for the multiplicity of interpretations of rules and working conditions which now seems to exist, and if some greater degree of uniformity can be obtained by national consideration, the tendency will gradually be to reduce the number of debatable disputes. Precedents will mean something, whereas they now often mean little or nothing."

Mr. Eastman said the bill neither undertakes to outlaw so-called company unions nor to promote the cause of the American Federation of Labor, and that six of the railroad labor organizations are not affiliated with the A. F. of L. "If a company union is what the employees really want," he said, "they are free to have it, and the same applies to the American Federation of Labor."

Mr. Harrison, who appeared as chairman of the legislative committee of the Railway Labor Executives' Association, said that organized labor is in substantial agreement with the provisions of the bill. He took the position that the company unions are in most cases "dummy unions" dominated by the companies. He also said that national adjustment boards had proved satisfactory during the federal control period and that the employees had sought to perpetuate them, but the failure of the railroads to agree had forced many controversies to the railroad labor board.

Theodore H. Davis, appearing on behalf of the seven shop crafts of the Pennsylvania system, protested against the passage of the bill on the ground that it would "destroy the amicable relations which have existed between the men whom we represent and the management of the railroad for the past thirteen years, and wipe out existing contracts which have been tried and proven to be practical, efficient and satisfactory to the men and which have effected the very results sought to be obtained by the railway labor act of 1926." He said that at the time of making the original agreement in 1921 it was demanded by the representatives of the employees that the management should compensate them while they were performing their duties as representatives of the men and that this request was agreed to and has continued with the approval of the men. This compensation amounts to no more than the men would have earned at their regular employment. This method of caring for the expenses of the associations, he said, has been one of the features of the plan which has particularly appealed to the employees, in that there have been no dues or assessments, and he desired to inform the committee that "during this whole period of approximately thirteen years there has been no interference by the management with the men in the selection of their representatives or with the representatives in the performance of their duties on behalf of the men."

D. F. Todd, system chairman of the Association of Clerical Employees on the Atchison, Topeka & Santa Fe, also asked that the right of such an association to continue be preserved.

Progress in Federal Valuation

According to a report on the current status of valuation which has been issued by the President's Conference Committee, 1,018 final valuation reports have been issued by the Interstate Commerce Commission up to February 28, on steam railroads with 227,360 miles of road. There are still 18 reports to be issued, covering the Illinois Central System, the Southern Pacific, Pacific System, and the Northwestern Pacific, embracing 15,247 miles of road.

The total final valuation of 1,046 properties, 28 of which are water carriers,

livery of railroad cars to a "steamship, ferry, or barge line for water transportation," without permission of the owners filed with the Car Service Division. The rule in question was intended to prevent delivery of railroad cars to the vessels of the Seatrain Lines, Inc., on the ground that the car service rules and laws pertaining to them were not intended to include the use of cars as mere containers or packages under circumstances in which the car would be "taken for a ride" in an ocean-going vessel.

The commission should find, Examiner Fleming says, that it has no jurisdiction of

Table I—Summary of 1,046 Final Valuations

	Tentative and Supplemental Tentative Valuations	Final Valuations	Net Increase or Decrease
Total cost of reproduction new.....	\$15,336,211,480	\$15,515,471,955	+\$179,260,475
Total cost of reproduction less depreciation.....	12,124,645,102	12,302,414,725	+177,769,623
Total present value of land, including rights.....	2,574,309,936	2,646,578,622	+72,268,686
Total final value.....	15,745,357,893	16,032,268,982	+286,911,089
Total working capital.....	427,699,080	412,742,376	-14,956,704
Total final value, less working capital.....	15,317,658,813	15,619,526,606	+301,867,793
+ Increase			
- Decrease.			

Table II—Progress in Bringing Valuations Up to Date

PERIOD	Complete			In Progress			Total	
	Number of Carriers	Mileage	Per Cent Total Mileage	Number of Carriers	Mileage	Per Cent Total Mileage	Number of Operating Carriers	Mileage
Valuation date to Dec. 31, 1927.....	873	232,635	93.3	12	16,669	6.7	885	249,304
Year 1928.....	721	122,171	49.0	164	127,133	51.0	885	249,304
Year 1929.....	718	120,478	48.3	167	128,826	51.7	885	249,304
Year 1930.....	689	104,775	42.0	196	144,529	58.0	885	249,304
Year 1931.....	577	52,689	21.1	308	196,615	78.9	885	249,304
Year 1932.....	422	33,349	13.4	463	215,955	86.6	885	249,304
Year 1933.....	0	0	0	885	249,304	100.0	885	249,304

electric roads and communication companies, is \$16,032,268,982, or an increase of \$286,911,089 over the total of the tentative or supplemental tentative valuations amounting to \$15,745,357,893. Details are given in the Table I. Progress in the completion of Order No. 3 work, covering additions and betterments subsequent to the date of valuation, is shown in Table II.

During the six months ended December 31, 1933, the Class I railroads expended approximately \$1,235,000 in connection with valuation, while the outlay for the I. C. C. Bureau of Valuation during the same

Table III—Cost of Federal Valuation To Date

	Bureau of Valuation	Class I Carriers
Previous to June 30, 1929.....	\$34,367,233	\$118,053,219
Year ended June 30, 1930.....	2,534,979	10,643,504
Year ended June 30, 1931.....	3,246,694	9,153,940
Year ended June 30, 1932.....	3,199,491	6,202,034
Year ended June 30, 1933.....	2,363,163	3,477,499
Six months ended December 31, 1933 (approximate).....	480,000	1,235,000
Total.....	\$46,191,560	\$148,765,196

period was about \$480,000. These figures increase the total expenditures for federal valuation to date to \$148,765,196 by the railroads and \$46,191,560 by the Interstate Commerce Commission.

I.C.C. Examiner Finds Railroads Need Not Furnish Cars for Seatrain

Examiner Harris Fleming of the Interstate Commerce Commission has recommended in a proposed report that the commission dismiss for want of jurisdiction complaints filed by the Hoboken Manufacturers' Railroad and the New Orleans & Lower Coast against the rules, regulations, and practices of the railroads, particularly Car Service Rule 4 of the American Railway Association, which prohibit the de-

livery of railroad cars to a "steamship, ferry, or barge line for water transportation," without permission of the owners filed with the Car Service Division. The rule in question was intended to prevent delivery of railroad cars to the vessels of the Seatrain Lines, Inc., on the ground that the car service rules and laws pertaining to them were not intended to include the use of cars as mere containers or packages under circumstances in which the car would be "taken for a ride" in an ocean-going vessel.

R.F.C. Loans to Railroads

Up to the end of March the Reconstruction Finance Corporation had advanced \$402,390,521 in loans to 68 railroads and receivers or trustees, of which \$57,209,334 had been repaid. Total authorizations amounted to \$412,445,678. The only new authorization in March was for \$100,000 to the Sumter Valley.

Examiner Recommends Approval of Grain Rates

Examiner R. L. Shanafelt has recommended in a proposed report that the Interstate Commerce Commission find justified a proposal by the railroads to cancel the application of proportional rail rates on grain and grain products from Ohio and Mississippi river crossings to the South when such traffic arrives at the crossings by boat or barge. Operation of the proposed schedules had been suspended on protest of the Inland Waterways Corporation and the Continental Export Company.

Western Railway Club to Discuss Diesel Locomotives

At the regular monthly meeting of the Western Railway Club to be held Monday evening, April 16, at the Hotel Sherman, Chicago, the subject "Diesel Locomotives" will be discussed by R. Tom Sawyer,

American Locomotive Company, New York. Following the principal address, a number of 15-minute prepared discussions will be presented by manufacturers of Diesel engines who have had experience in adapting this type of power to railway service.

Illinois Grade Crossing Hearings Postponed

Hearings before the Illinois Commerce Commission, scheduled for April 4 and 5 at Springfield, Ill., on an order directing all principal railways in the state to show cause why a program for the elimination and improvement of grade crossings should not be inaugurated, were postponed at the request of railroad representatives, until April 26 and transferred to Chicago. Similarly, hearings set for April 13 and 14 at Chicago were also postponed until April 26.

Erie to Increase New York-Chicago Service

The Erie, beginning with the summer time-table, June 17, will operate two through fast passenger trains between New York and Chicago; trains 5 and 6, now in operation east of Cleveland only, being extended to Chicago, providing both morning and evening departures from each terminal. Trains 9 and 10, now operating between New York and Salamanca, will be extended to Jamestown, N. Y., 447 miles from New York. Air conditioning is to be provided on all through-line passenger cars.

New York Railroad Club Meeting April 20

Walter S. Franklin, vice-president in charge of traffic of the Pennsylvania, will be the speaker at the next meeting of the New York Railroad Club, to be held on April 20 in the auditorium of the Engineering Societies building, 29 West Thirty-ninth street, New York. Taking as his subject "Collection and Delivery Freight Service," Mr. Franklin will describe the recently-inaugurated l.c.l. store-door operations of the Pennsylvania. Following his address, Mr. Franklin will answer questions relating to the new service.

Rail-Water Circle-Trips Popular

Rail-water circle-trips, operated by the Grace Line in conjunction with the railroads, resulted in revenues to the latter of approximately \$250,000 in 1933, according to figures recently made public by the participating steamship company. These Grace Line figures show that business has increased 376 per cent over the past three-year period. The circle trip plan, as was pointed out in the *Railway Age* of November 4, 1933 permits the traveler to proceed by rail to a port on either the Atlantic or the Pacific coast and thence by water through the Panama Canal to the opposite coast, returning by rail to the starting point.

Wage Statistics for January

Class I railways, excluding switching and terminal companies, reported to the Interstate Commerce Commission a total of

966,365 employees as of the middle of January, which was almost the same as the December figure. The total compensation for the month was \$120,695,249. The number in January was 2.15 per cent greater than that for the same month of the preceding year. The number who received some pay either for full or part time during the month was 1,071,220, which was 1.91 per cent less than the corresponding total for December. The aggregate number of hours paid for in January was 7.11 per cent greater than that in January, 1933.

Railway Employment Increased in March

The number of employees of Class I railways, excluding switching and terminal companies, as of the middle of March was 998,812, according to the Interstate Commerce Commission's monthly compilation, an increase of 22,986 as compared with the number in February. This was also an increase of 8.58 per cent as compared with the number in March, 1933. The number in the maintenance of equipment and stores group increased 13.75 per cent and the number in the train and engine service group increased 13.14 per cent, while the group of executives, officials, and staff assistants decreased 2.97 per cent.

New York Suburban Service

The New York State Public Service Commission, continuing its investigation of commutation fares to and from New York City, held a further hearing on April 9, at which the principal fact brought out was that all of the roads object to the reduction of revenue which would be forced upon them if they were to issue 46-trip monthly tickets. The hearing is to be continued at New York on April 26. Tickets for 46 trips in a month, to accommodate people who work in New York only five days a week, have been in use experimentally on the Erie, since February 1. With these, it was stated that the number of monthly ticket holders has been increased 8 per cent, but that the gross income from monthly tickets has fallen off 12 per cent.

A 27-Car Beer Train

A train of 27 carloads of beer was handled over the Illinois Terminal and the Chicago & North Western from St. Louis, Mo., to Chicago, where it arrived on March 23. The train, which is one of the largest beer trains handled since beer was legalized, was destined to the new plant of the Anheuser-Busch Company of St. Louis which has been estab-

lished as the principal distributing point for that company's beer in Chicago. Track facilities serving the plant provide for the spotting of 11 cars and the storage of an additional number.

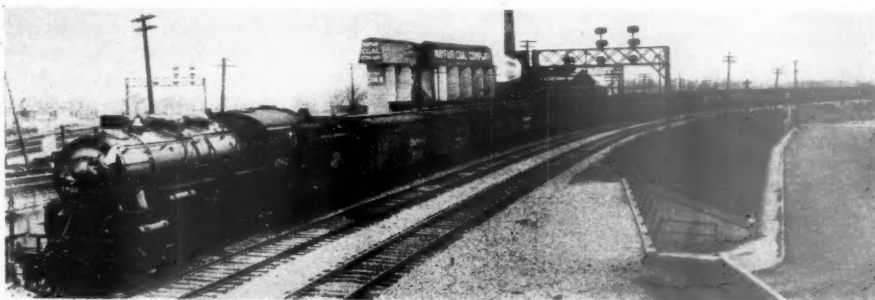
Examiner Recommends Reduced Sugar Rates from North Atlantic Ports

Examiner M. L. Boat of the Interstate Commerce Commission has recommended in a proposed report that the commission authorize the railroads to establish and maintain from north Atlantic ports and points grouped therewith to points in Illinois, Indiana, and border points in adjacent states reduced rates on sugar to meet the competition of all-rail rates from New Orleans to the destination territory which reflect the competition of barge and barge-truck routes from New Orleans to that territory, without reducing the rates to intermediate points which are not affected by that competition. The proposed rates are to be based on a minimum of 80,000 pounds and substantially 24 per cent of the first class rates, whereas the present rates from north Atlantic ports to central territory are the sixth-class rates, 27.5 per cent of first class, and are subject to a minimum of 60,000 pounds. The application was supported by refiners of sugar with plants at the north Atlantic ports and by commercial interests at New York and Baltimore, but were opposed by producers of sugar beets and beet sugar in central territory and in part by the southern carriers.

Grand Trunk 100 Years Old

In commemoration of its 100th birthday, on March 17, the Grand Trunk Western distributed a piece of literature which illustrated transport progress by a photograph comparing a locomotive of 1874 with a modern locomotive.

The circular reads as follows: "Strange contrasts mark the attainment of today's speeding giants on the Grand Trunk Railway, which this month celebrates its hundredth anniversary. The Detroit & Pontiac Railway, first of the smaller lines which form part of the Grand Trunk as it is today, was inaugurated in March, 1834. At first, horses hauled cars over strap-iron rails. Then came the Sherman Stephen, a snorting locomotive which terrified horses and horrified pedestrians. This and several other primitive types were followed by an engine built in 1874, having a weight, with the tender, of 133,250 lb. and tractive power of 15,400 lb. It was 50 ft. in length with its tender. Notwithstanding the



One of the Largest Beer Trains Handled Since Beer Was Legalized

marked improvement of this engine over earlier types, it seems almost insignificant compared with such a modern giant as the '6000' type which hauls the International Limited train between Chicago and Montreal in 17 hr. 10 min. This locomotive, with its tender, weighs 604,600 lb. and has a tractive power of 50,000 lb. Its engine and tender together are 92 ft. in length."

New York Suburban Fares to be Reduced

The Pennsylvania, beginning May 1, will inaugurate material reductions in rates on various classes of tickets, between all stations in the region between New York and New Brunswick, N. J., (33 miles) and Perth Amboy, N. J. Several new forms of multiple-ride tickets are being introduced. This arrangement is an experiment to be continued six months. The forms are:

- (1) A round-trip ticket, usable only on the day of sale, making reductions as much as 40 per cent.
- (2) A round-trip ticket, usable within 30 days, reduction 20 per cent.
- (3) A 10-trip ticket, usable within six months, for bearer and friends (like a

Between Hudson Terminal and	Present 2-way fares	NEW FARES					Present monthly rate
		1	2	3	4	5	
Elizabeth (15 mi.)	\$0.92	\$0.50	\$0.75	\$3.15	\$2.15	\$5.15	\$8.58
New Brunswick	2.26	1.30	1.85	7.85	3.30	7.95	13.20
Between							
Penn Station and Elizabeth	....	....	....	....	3.65	7.65	....
Penn Station and New Brunswick	....	....	....	....	4.80	10.45	....

family ticket), the rate to be lower than for the tickets indicated in paragraph 2.

(4) A 12-trip weekly individual ticket, to be used between Sunday morning and Saturday night. This type of ticket is now in use on the Long Island and has proved popular. This will be sold at about one-fourth the regular monthly commutation rate.

(5) A 20-trip individual ticket, usable within 30 days; this is for the benefit of part-time workers.

The accompanying table shows examples of rates under the new tariff.

No change is to be made in the existing low fares between Hudson Terminal, Manhattan, and Newark, N. J., these rates being now on the same basis as those in the new tariff, but the round-trip fare for one-day tickets between Newark and Pennsylvania station will be reduced.

The experimental low rates, established on the Long Island last year, brought out an immediate favorable response, the traffic from May to December having recorded seven million additional passengers directly traced to the new fare.

SIMILAR TARIFFS ON C. N. J.

The Central of New Jersey will also inaugurate new low rates, beginning May 1, for an experimental period. The present 10-, 50-, and 60-trip tickets will be continued. Single round-trip tickets usable within 30 days between all stations, New York to Raritan, inclusive, including Perth Amboy, Newark, Sound Shore and Flemington branches, 80 per cent of twice the present one-way fare. Ten-trip tickets good for bearer on a basis of 2½ cents a

mile on one-way distances; usable within six months.

Twelve-trip weekly; price one-fourth of the 60-trip monthly ticket. These only for the original purchaser and to be used between Sunday morning and Saturday night.

Twenty-trip calendar month tickets: price 60 per cent of the present 60-trip calendar month ticket. These will be sold at any time during the month but will be valid only during the month in which issued; good only for purchaser.

Example of new fare: Between New York and Plainfield, round-trip rate reduced from \$1.74 to \$1.40.

Railroad Credit Corporation

The Railroad Credit Corporation had on March 31, returned to the railroads \$8,872,192 of the emergency revenues which were turned over to it for temporary use in protecting the railroad credit position. An additional repayment of approximately \$735,000 will be made on April 30, which will bring the total liquidating distributions up to 13 per cent of the net contributions.

In a letter addressed to participating

carriers accompanying the March financial statement, a copy of which was filed with the Interstate Commerce Commission, E. G. Buckland, President of the Corporation, said:

"The sixth distribution, amounting to \$728,633, or 1 per cent of the Fund, was made March 31, 1934. This brings the total liquidating distributions to \$8,872,192, of which \$3,652,219 has been returned in cash, and the remainder, or \$5,219,973, credited on obligations of participating carriers to the Corporation. The seventh distribution, equivalent to 1 per cent of the Fund, has been authorized by the Board to be paid on April 30, 1934. Cash receipts during March totaled \$405,477, made up of payments in reduction of loans, \$321,048; interest on obligations, \$72,827; and miscellaneous accounts, \$11,602."

Western Roads Extend Low Fares Four Months

Western railroads will continue for another four-months period, terminating September 30, the reduced passenger fares established last December, it was decided at a meeting of the Western Association of Railway Executives in Chicago, on April 6. According to Harry G. Taylor, chairman of the association, figures indicate the reduced fares have met favorable response from the public, and while revenues have possibly not been as great as was hoped for, the belief prevails that extension of the experiment is warranted.

The general basis of fares is 2 cents a mile one way in coaches, 1.8 cents a mile each way for round trips in coaches, 3

cents a mile one way in sleeping cars, 2 cents a mile each way for round trips in sleeping cars, with a 10-day limit, and 2½ cents a mile each way for round trips in sleeping cars with longer limits.

The western lines have named a committee of presidents to confer with similar groups from the east and south, in an effort to bring about an adoption of a uniform reduction basis.

During December, 1933, passenger revenues in the southern and western districts fell off .06 and 11.6 per cent respectively, as compared with December, 1932. In January, 1934, passenger revenues in the southern district increased while those in the western district declined, as compared with the same month in 1933. However, the revenue passengers carried one mile increased 37.27 per cent in the southern district but declined only .069 per cent in the western districts in December, 1933, as compared with December, 1932.

Overnight Service for Strawberries

Special overnight freight service has been arranged by the Missouri Pacific to handle the crop of Arkansas White River Valley strawberries this year. Car lots of berries loaded in the so-called Judsonia district, which includes Cabot, Ark., Ward, Beebe, McRae, Higginson, Searcy, Kensett, Bald Knob, Russell, Bradford and Newport, in addition to Judsonia, will leave those places between 7 and 10 p.m. each night and arrive at St. Louis at 6 and 7 the following morning. The total crop in the Judsonia district is estimated at 1,450 carloads. In addition, about 400 carloads will be produced in Arkansas River valley between Little Rock, and Van Buren, and about 300 carloads in the White River valley between Newport, Ark., and Carthage, Mo.

Fewer Casualties in Crossing Accidents

For the fourth consecutive year there was a reduction in 1933 in the number of casualties resulting from accidents at railroad-highway grade crossings with the result that fewer persons lost their lives in such accidents during the past calendar year than in any similar period since 1916, according to reports made public by the Safety Section of the American Railway Association. Complete reports for 1933 show that 1,511 persons lost their lives in railroad-highway grade crossing accidents. For the fiscal year ended June 30, 1916, there were 1,396 such fatalities.

The total number of fatalities in 1933 was a reduction of 14 compared with the number in 1932, while persons injured in such accidents in 1933 totaled 3,697, a reduction of 292 compared with the preceding year. In 1933, there were 3,235 accidents at railway-highway grade crossings compared with 3,499 in 1932, or a reduction of 264.

Trucks To Be Registered

Plans for registration of 1,600,000 vehicles under the Code of Fair Competition for the trucking industry are nearing completion, it was announced on April 6 by

National Recovery Administrator Hugh S. Johnson. With officials of the administration, members of the industry have been working out the details of registration which, for the first time, will give the government a comprehensive picture of this industry.

"The industry anticipates," General Johnson said, "that the effective operation of the provisions of this code will tend not only to stabilize the employment and operating conditions within the industry, but will provide data which are essential to the satisfactory solution of the complex problems created by the rapid and extensive growth of highway transportation. To date no complete or accurate data have been available to serve as a basis for the solution of these problems." Since the approval of the trucking code, state code authorities for most of the states have been approved, regions have been set up and state areas designated in order to insure effective administration of the code.

"The Trucking Industry," General Johnson added, "represents one of the largest under the jurisdiction of the National Recovery Administration. This is the first time any attempt has been made to regulate it on a national scale. In the opinion of officials of the National Recovery Administration who have been working for months with members of the industry on the details of the code, the regulation provided through it will result in substantial benefit to the industry and will promote the President's re-employment program to the extent of adding 300,000 wage earners to truck operators' payrolls. The N. R. A. code for this industry is an important step toward stabilization of the Trucking Industry. This administration will exert every effort to effect this code and to enforce compliance."

Netherlands Railways Order 40 Diesel-Electric Trains

The Netherlands Railways have ordered 40 Diesel-electric train units. It is expected that the first of these trains will be placed in operation in Holland about May 15, 1934. Each of these train units consists of three cars, articulated, streamlined and designed for a top speed of 87 m.p.h. In general appearance they will resemble the German two-car articulated, streamlined "Flying Hamburger" train which is operated between Hamburg and Berlin.

The Holland trains are about 65 ft. longer than the German trains, but despite the increase in length due to the use of a three-car instead of a two-car unit, the light weight of both trains is practically identical; namely 75 metric tons. These new cars will weigh less than half as much as the ordinary Dutch passenger cars of equivalent weight and capacity, an unusual accomplishment when it is considered that European passenger cars already weigh far less than corresponding American equipment. The desired reductions in weight were obtained by careful designing; the use of electric welding instead of riveting; the employment of aluminum for doors, baggage racks, reservoirs, air ducts and other parts; also the

application of pressed steel wheels and hollow axles.

Thirty-five of the units are being equipped with two 410-hp. Maybach Diesel engines and five with two 375-hp. Ganz Diesel engines. The engines and electric generators are rubber mounted and are located in the center of the middle car. Operation may be from either end.

Seating capacity is provided for 48 second-class and 112 third-class passengers. Heating is effected by the engine cooling water which, in turn, and when necessary, is further automatically heated by an oil-burning boiler, temperatures being governed by thermostats. Windows are kept closed at all seasons, provision being made for a sufficient supply of clean air for ventilation, heated in winter time as required. Brakes are of the automotive type, with brake drums and Ferrodo lined brake shoes.

Southern Proposes Extension of Low-Fare Experiment

(Continued from page 554)

The petition outlines the results of various experimental fares tried by the Southern in an effort to determine whether the lost traffic could be regained and made profitable through reduced fares. Two-cent fares were first tried over different parts of the lines and had the effect of showing an increased number of passengers but not enough to offset the reduction in fares. It was then concluded to try one-and-one-half cent fares on various lines and the results obtained were so encouraging as to warrant consideration being given to an extension of the same basis between all points on the Southern System. Coach fares at approximately a cent and one-half a mile and three-cent fares good in parlor and sleeping cars without surcharge were then established on December 1 for an experimental period of six months and figures are given in the petition to show that in December, January, and February the passenger revenues on the various lines of the system were greater than in the corresponding months of the year before except that on the Southern there was a very slight reduction in December.

In December the number of passengers on the Southern Railway showed an increase of 97.47 per cent while the passenger revenues showed a decrease of .04 per cent. In January the number of passengers showed an increase of 109.3 per cent and the revenues an increase of 10.75 per cent. In February the increase in number of passengers was 110.05 per cent and the increase in revenues 18.55 per cent. "With such a favorable showing," the petition says, "it is unthinkable that these petitioners should abandon the experiment at this time." To show that the reduced coach fare has not drawn passengers from parlor or sleeping cars attention is called to the fact that the Pullman Company's revenue from passengers over the Southern during December, 1933, was \$115,038, as compared with \$102,222 in December, 1932, and in January, 1934, it was \$118,595 as compared with \$96,895 in January, 1933.

Construction

CHESAPEAKE & OHIO.—A contract has been given to Esker W. Waugh, Huntington, W. Va., for constructing a warehouse and siding at Huntington, W. Va., to cost about \$40,275. A contract has also been given to the Industrial Brownhoist Corporation, Bay City, Mich., for material which is to be placed by the railroad company's forces in constructing a coal retarder and car cover on west dumper Presque Isle dock, Toledo, Ohio, to cost about \$40,078.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—This company has applied to the Interstate Commerce Commission for a certificate authorizing it to construct and operate an extension from Sunset, Mont., to the mouth of Cottonwood Creek, 14.13 miles.

DELAWARE, LACKAWANNA & WESTERN.—The New York Public Service Commission has amended its order providing for the reconstruction of the underpass which carries Nottingham road under the Lackawanna tracks in the Town of DeWitt, Onondaga county, N. Y. The construction cost has been reduced from \$52,000 to \$28,200.

ERIE-LEHIGH VALLEY.—An order directing the reconstruction of the structure carrying the tracks of the Erie and the Lehigh Valley over the Waverly-Owego state highway in the town and county of Tioga, N. Y., has been affirmed by the New York Public Service Commission. The cost of the work as ordered and based on recent prices would not exceed \$100,000.

LONG ISLAND.—This company has given a contract to the Poirier-McLane Corporation, New York, to eliminate Middle Neck road crossing at Great Neck, Long Island, N. Y. The work, costing \$258,490, will involve the use of about 300 tons of steel.

PENNSYLVANIA.—The Public Service Commission of Pennsylvania has ordered that the Harrison street grade crossing of this road's Pittsburgh division in Penn township, Westmoreland County, Pa., be abolished by construction of a pedestrian subway. The project, estimated to cost \$58,000, also includes the reconstruction of the Burrell bridge over the four main tracks of the P.R.R. at the same location.

PENNSYLVANIA.—The Chemung street and Sayre street crossings of this road in the village of Horseheads, Chemung county, N. Y., will be eliminated by closing Chemung street and constructing an overhead crossing in Sayre street between Hulett road and Grand Central avenue and a connecting highway from Chemung street to Sayre street. The estimated cost of this work is \$174,300, exclusive of land and property damages. The North Main street crossing in the same village is to be eliminated by raising the highway and carrying it over the railroad, at an estimated cost of \$88,000 for construction and engineering and \$20,920 for land and property.

Equipment and Supplies

P.W.A. Loans to Railroads

The Public Works Administration has signed contracts with the New York, New Haven & Hartford for loans of \$1,300,000 for rail and \$2,300,000 for equipment. With these P.W.A. now has under contract \$171,272,000 of the \$199,607,800 allotted to railroad companies and contracts covering the balance are in course of preparation.

Public Works Administrator Harold L. Ickes has signed a contract with the Maine Central Railroad Company for a loan of \$313,000.

The Maine Central will use its loan for purchasing and laying new rail, fastenings and switches. The total cost of these roadway improvements will be \$323,000. The company will add \$10,000 of its own money to the \$313,000 loaned by P.W.A. Materials to be purchased include 4,200 tons of rail costing \$168,798 delivered, \$105,147 worth of tie plates, spikes, joints and other fastening materials, \$18,903 worth of frogs and switches, \$3,913 worth of guard rails, and miscellaneous materials for signal system improvements costing \$4,785. The company estimates that it will pay its track forces \$21,500 for installing these materials.

Mr. Ickes announced on April 10 that \$1,400,000 has been advanced to the Chicago & North Western to pay for rails and fastenings purchased by it under a previously made allotment. This brings the total of P.W.A. cash advances to railroad companies to \$20,332,000. Other large advances are to be made within a few days.

Public Works Administrator Ickes has signed a contract for a loan of \$250,000 to the Interstate enabling that company to give its shop forces at Andover, Virginia, 130,000 man-hours of additional employment in rebuilding 500 coal cars.

LOCOMOTIVES

THE BOSTON & MAINE is inquiring for 10 locomotives, including five of the 4-6-2 type and five of the 4-8-2 or 4-8-4 type.

THE DELAWARE, LACKAWANNA & WESTERN, reported in the *Railway Age* of March 3 as inquiring for 20 locomotives of the 4-8-4 type, has ordered this equipment from the American Locomotive Company. Orders have also been placed for two oil-electric locomotives of 600 hp. with the General Motors Corporation (Winton Engine Corporation) and for two oil-electric locomotives of 600 hp. with the Ingersoll-Rand Company.

THE PENNSYLVANIA has placed orders amounting to over \$500,000 with the Allis-Chalmers Company, Milwaukee, Wis., for electrical propulsion and control apparatus with which to equip 14 electric switching locomotives on which work has been started at the Pennsylvania's Altoona, Pa., works. Their cast steel frames will be produced in outside industries. Known as type B-1, these switching locomotives will have three driving axles, but no trucks,

and will weigh 158,000 lb. The diameter of the driving wheels will be 62 in., the length coupled will be 31 ft. 6 in., and the maximum sustained speed 25 m.p.h. The wheelbase will be 12 ft. 8 in. Each locomotive will have three motors with an accelerating tractive effort of 50,000 lb. To provide heavier power units, the B-1 locomotives will be operated in multiple, according to size and weight of trains. A total of 101 electric freight, passenger and switching locomotives will be built by the Pennsylvania as part of its employment and improvement program financed by the Public Works Administration. The total expenditure by the Pennsylvania for new locomotives under the P.W.A. program will approximate \$15,000,000.

FREIGHT CARS

THE ERIE has ordered 50 bulk cement cars of 50 tons' capacity from the Greenville Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of March 17.

THE DELAWARE, LACKAWANNA & WESTERN, reported in the *Railway Age* of March 3 as inquiring for 500 steel hopper cars, has ordered 350 steel hopper cars of 50 tons' capacity from the American Car & Foundry Company and 150 from the Magor Car Corporation.

PASSENGER CARS

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC, reported in the *Railway Age* of January 6 and 13 as inquiring for 50 coaches and 25 baggage-express cars, will build this equipment in its own shops having received a loan from the P.W.A. to carry out this work.

IRON AND STEEL

THE SOUTHERN PACIFIC is inquiring for 480 tons of structural steel for a bridge at Gaviota, Cal.

SIGNALING

The Milwaukee Goes to Cab Signals

Acting on a petition of the Chicago, Milwaukee, St. Paul & Pacific, the Interstate Commerce Commission, by Division 6, has upon reconsideration, modified its automatic train control orders of 1922 and 1924 to permit this company to use on its line an automatic cab-signal system in lieu of automatic train-stops. The system is the Union continuous, and it extends between Portage, Wis., and Hastings, Minn., 212 miles, double track.

In August last, the Commission denied the application of the road for permission, because of light traffic, to suspend operation of its automatic-train control completely; and the proposal to permit the discontinuance of the brake apparatus, if cab signal operation were to be continued, was unacceptable to the road. The indications of an increase in traffic in 1933 were noted.

The company's willingness now to accept an order for the operation of cab signals

without brake-setting apparatus is due mainly to the fact that 30 new freight locomotives will probably soon be bought, and the installation of complete A.T.C. on these would cost about \$6,000. To reduce the expenditure for equipping these new locomotives, and also to reduce future expense of maintenance on all locomotives used in this territory, the road now recedes from its previous position.

MOTOR VEHICLES

THE BOSTON & MAINE TRANSPORTATION COMPANY and the MAINE CENTRAL TRANSPORTATION COMPANY, highway subsidiaries, respectively, of the Boston & Maine and the Maine Central, are expected shortly to purchase 14 or 15 motor coaches. The Boston & Maine is considering buying 10 and the Maine Central, 4 or 5. The equipment will be used on the joint Boston, Mass.,-Portland, Me.-Bangor line of the two companies.

THE NEW YORK, NEW HAVEN & HARTFORD has purchased five 17-passenger motor coaches and fifteen 21-passenger motor coaches from the General Motors Truck Company, Pontiac, Mich., for operation by the New England Transportation Company. It has also purchased five tractor-auto-carrying-trailer units from the Ford Motor Company, Detroit, Mich. These will be used for the delivery of automobiles from the New Haven's railway and steamship freight stations to automobile dealers in New England.

MISCELLANEOUS

THE PENNSYLVANIA has placed an order with the Positive Rail Anchor Company, Chicago, for 200,000 rail anchors.

THE NEW YORK CENTRAL has placed an order with the Timken Roller Bearing Company, Canton, Ohio, for bearings and boxes to be used under 29 existing six-wheel truck class J-1 passenger locomotive tenders.

THE DELAWARE, LACKAWANNA & WESTERN has placed an order with the Timken Roller Bearing Company, Canton, Ohio, for roller bearings on all axles including driving axles of 18 class 4-8-4 large steam locomotives which will be built by the American Locomotive Company. The Lackawanna has also placed an order with the Timken company for bearings for use in engine trucks under 10 existing locomotives.

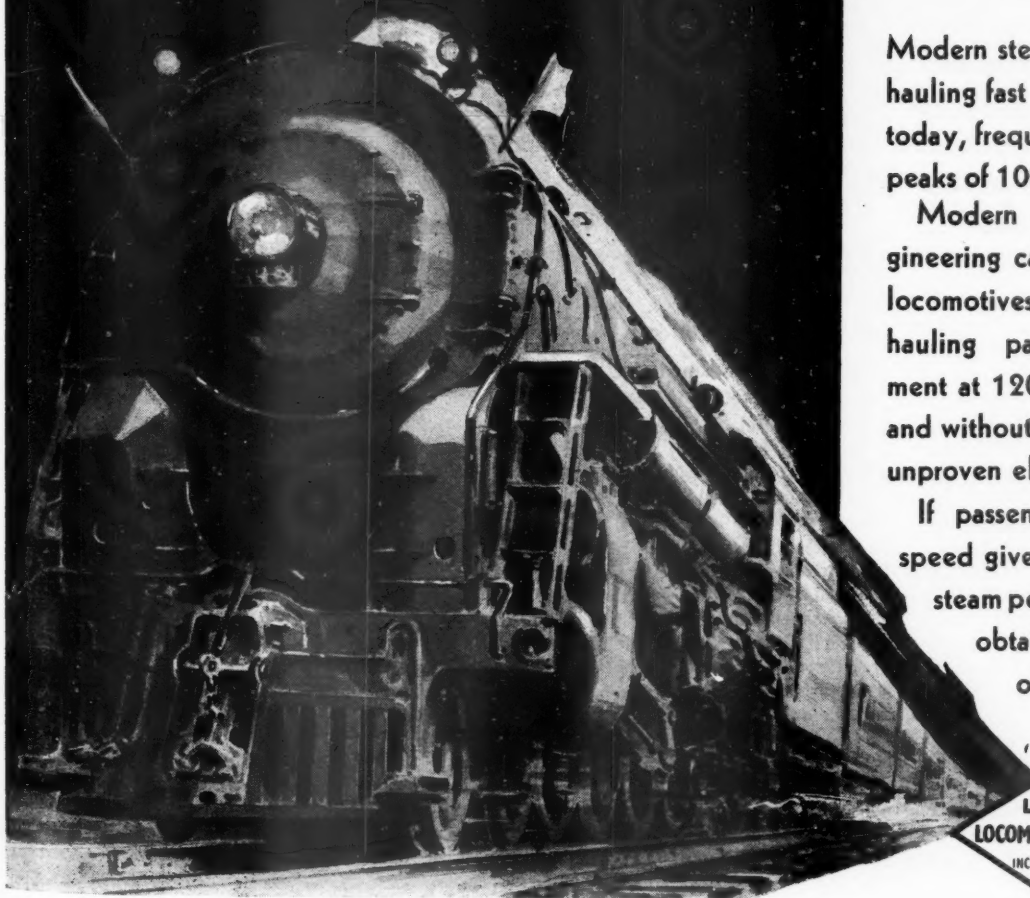
Air-Conditioning

The Erie has placed an order with the Safety Car Heating & Lighting Company for steam-ejector air-conditioning apparatus for 18 Pullman sleeping cars, 14 coaches, 2 parlor-buffet cars and 2 dining cars.

The New York Central has given an order to the Frigidaire Sales Corporation for installing its electro-mechanical air-conditioning equipment in six dining cars and nine coaches. The axle generator equipment will be supplied by the Westinghouse Electric & Manufacturing Company.

Steam

FOR SPEED, RELIABILITY
AND ECONOMY



Modern steam locomotives, hauling fast passenger trains, today, frequently operate at peaks of 100 miles per hour.

Modern locomotive engineering can supply steam locomotives capable of hauling passenger equipment at 120 miles per hour and without introducing any unproven elements.

If passengers want high speed give it to them with steam power and thereby obtain a maximum of safety.

LIMA
LOCOMOTIVE WORKS
INCORPORATED

Supply Trade

The Pressed Prism Plate Glass Company has moved its general offices to 13 North LaSalle street, Chicago.

Ralph A. Brown has been appointed superintendent of the Morden Frog & Crossing Works, Chicago, to succeed B. T. Gibbs, resigned.

The Tanner-Willard Company, 317 North Eleventh street, St. Louis, Mo., is now handling the sale of the American Hoist & Derrick Company's (St. Paul, Minn.) equipment to railroads in the St. Louis territory.

John E. Dixon, vice-president in charge of sales of the Lima Locomotive Works, Incorporated, since its reorganization in 1916, has been made vice-president in charge of both sales and engineering. Mr. Dixon's headquarters will continue to be at New York.

The Westinghouse Electric & Manufacturing Company, at its annual meeting on April 11, elected two new directors, A. L. Humphrey, chairman of the board of the Westinghouse Air Brake Company, and H. S. Wherrett, president of the Pittsburgh Plate Glass Company. At the same meeting five other directors now serving on the board were re-elected.

The Gate City Iron Works, Omaha, Neb., has been appointed distributors of Toncan copper molybdenum iron; the Barde Steel Company and the Doran Company, both of Seattle, Wash., have been appointed distributors of Enduro stainless steel, according to a recent announcement of the Republic Steel Corporation, Youngstown, Ohio. Enduro is produced by the Central Alloy division of Republic, Massillon, Ohio.

A. L. Clark has been elected president of the American Brake Shoe & Foundry Company of California, San Francisco, Cal., to succeed Thomas Finigan, deceased. Mr. Clark has been actively engaged in the foundry business since 1902, at which time he entered the employ of The American Brake Shoe & Foundry Company as chief clerk at its Mahwah, N. J., plant, having previously been in the employ of the Sterling Iron & Railway Company as storekeeper. He later served in the accounting department and became traveling auditor, and in 1905 entered the operating department as assistant to the general superintendent. In 1909 he was appointed superintendent of the Norwood, Mass., plant, and three years later superintendent of the new Chicago plant. In 1913 he was promoted to general superintendent of western foundries, and during the war period was acting works manager. In 1921 Mr. Clark was appointed general manager of The American Brake Shoe & Foundry Company of California, and in 1922 was elected vice-president, which position he continued to hold until his election as president of the same company.

Poor & Co. Annual Report

The annual report of Poor & Co. for 1933 shows a net loss of \$236,998 after all charges, including amortization of patents and loss on the sale of securities, compared with a net loss of \$480,875 in 1932. Sales in 1933 totaled \$2,409,187, as compared with \$2,184,426 in 1932. The consolidated statement of profit and loss as of December 31, 1933, as compared with 1932, follows:

	1933	1932
Net sales (gross sales, less returns and allowances)	\$2,409,187	\$2,184,426
Purchases and production cost of product sold, including purchased product, labor, material and production expenses, but not including provision for depreciation	1,854,761	1,743,011
Gross profit on sales.....	\$554,426	\$441,415
Selling, administrative and royalty expenses, including salaries, commissions, traveling expenses, rent, taxes, royalties, etc., but not including interest, patent acquisitions and expense, etc.	625,715	739,718
Loss from operations.....	\$71,289	\$298,303
Expenditures for patent rights, patents and expenses incident to the acquirement and protection of patents and patent rights	\$55,527	\$44,165
Provision for amortization of patents of The Rail Joint Company and The Rail Joint Company of Canada, Ltd.	13,632	18,217
Provision for depreciation of buildings and equipment	87,582	97,616
Total patent and depreciation expense	\$156,741	\$159,998
Loss before deducting interest, but not including interest and investment income received and profit from disposal of investments and fixed assets.....	\$228,030	\$458,301
Interest received and income from investments and other income.....	74,158	114,773
Interest paid	159	.....
Excess of par value of bonds retired over cost of acquirement	45,913	.....
Loss from disposal of securities and fixed assets	5,144	7,053
Loss before deducting interest on convertible gold notes	\$113,262	\$350,581
Bond interest and expense	123,736	130,294
Net loss for period.....	\$236,998	\$480,875

Cross Tie Division Established Under Lumber Code

National Recovery Administrator Hugh S. Johnson has issued an order approving amendments creating a railroad cross tie division under the code for the lumber and timber products industry. The order will be made effective April 14, to give time for objections to be filed. General Johnson directed that within 90 days the Railway Tie Association and the Lumber Code Authority shall make further study and investigation to determine whether the constitution of the co-ordinating committee and the subdivision administrative agencies of the Railroad Cross Tie Division are truly representative of the cross tie industry in the various districts. The Administrator also stated in the order that within 120 days he would review the constitution of the co-ordinating committee and the

sub-division administrative agencies with a view to making possible changes.

In 1928, the railroad cross tie industry had 53,000 employees and sold 85,000,000 ties. In 1933, the production had fallen to 40,000,000 ties and there were 30,000 employed. The amendments correlate the wages and hours of those employed in the cross tie industry with those engaged in similar occupations under the jurisdiction of the lumber and timber products code. The amendments also make subject to the conservation provisions of the lumber code many wood lots that have been exempt.

Code Approved for Special Track Equipment Industry

National Recovery Administrator Johnson on April 7 announced approval of the code for the railroad special track equipment industry, providing for a 40-hour, 6-day week for factory employees but allowing for six 48-hour weeks in each six-month period provided time-and-one-half is paid for overtime.

OBITUARY

Earl C. Brown, vice-president of the Mississippi Valley Structural Steel Company, with headquarters at St. Louis, Mo., died in that city on March 28 of heart failure.

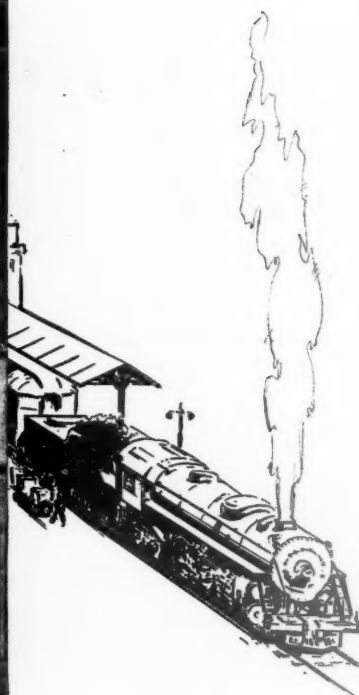
Financial

ATCHISON, TOPEKA & SANTA FE.—*Annual Report*.—The annual report of this company for 1933 shows net corporate income of \$3,698,671, as compared with \$7,545,007 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
RAILWAY OPERATING REVENUES	\$119,826,437	\$133,133,537	-\$13,307,100
Maintenance of way	15,417,928	15,342,514	+75,414
Maintenance of equipment	27,849,273	31,536,604	-3,687,331
Transportation—Rail	40,596,815	43,997,003	-3,400,188
TOTAL OPERATING EXPENSES	93,803,318	101,918,323	-8,115,005
NET REVENUE FROM OPERATIONS	26,023,119	31,215,215	-5,192,096
Railway tax accruals	11,398,973	12,824,970	-1,425,997
Railway operating income	14,575,195	18,352,677	-3,777,482
Hire of equipment	77,612	43,959	+33,653
—Cr. Joint facility rents	781,158	788,198	-45,796
NET RAILWAY OPERATING INCOME	13,961,760	17,659,793	-3,698,033
Non-operating income	2,996,067	3,239,958	-243,891
GROSS INCOME	16,957,827	20,899,752	-3,941,925

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YOU CAN ALWAYS TELL



When a Booster engine starts your train out of a station, you feel the increased starting power. You think it is a "double header", but it isn't.

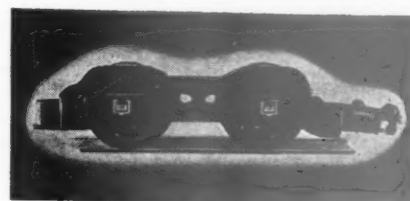
It's only the little unseen engine applying its power to the trailing wheels. It changes a Pacific type locomotive into a Consolidation just in starting. Then the big boiler "keeps them going".

This means passenger trains on time.

It means freight trains with more tons, and more dollars per train.

It means lowered locomotive main-

tenance due to the ability of a Booster locomotive to do the job of a non-Booster locomotive having another pair of drivers. This saving often amounts to several cents per mile and in itself is enough to justify a Booster application program.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

Rent for leased roads	8,327	8,327	.....
Interest on funded debt	12,803,629	12,804,313	-684
NET CORPORATE INCOME	\$3,698,671	\$7,545,007	-\$3,846,336

CENTRAL OF GEORGIA.—*Annual Report.*—The 1933 annual report of this company shows net deficit, after interest and other charges, of \$2,669,565, compared with net deficit of \$3,341,676 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
Average Mileage Operated RAILWAY OPERATING REVENUES	1,935.73	1,944.65	-8.92
	\$12,132,343	\$11,547,648	+\$584,695
Maintenance of way	1,417,876	1,427,497	-9,620
Maintenance of equipment	2,668,084	2,290,480	+377,604
Transportation—Rail	4,849,627	5,156,746	-307,119
TOTAL OPERATING EXPENSES	10,356,850	10,422,516	-65,667
Operating ratio	85.37	90.26	-4.89
NET REVENUE FROM OPERATIONS	1,775,494	1,125,132	+650,362
Railway tax accruals	794,926	1,152,238	-357,312
Railway operating income	978,500	* 32,597	+1,011,097
Equipment rents—Net Dr.	203,164	96,834	+106,329
Joint facility rents—Net Dr.	139,325	142,443	-3,118
NET RAILWAY OPERATING INCOME	636,011	271,874	+907,885
Non-operating income	431,840	626,672	-194,832
GROSS INCOME	1,067,852	354,799	+713,053
Rent for leased roads	377,712	343,597	+34,115
Interest on funded debt	3,035,978	3,004,679	+31,298
TOTAL DEDUCTIONS FROM GROSS INCOME	3,737,417	3,696,475	+40,942
NET INCOME	*\$2,669,565	*\$3,341,676	+\$672,111

* Deficit.

CHICAGO, BURLINGTON & QUINCY.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line between Shabbona, Ill., and Paw Paw, 6.79 miles.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for an issue of \$1,716,000 of 4 per cent equipment trust certificates in connection with a loan from the Public Works Administration for the construction of 50 passenger coaches and 25 baggage express cars, superseding its previous application for an issue of \$5,720,000 of certificates. It also asks authority to pledge as collateral \$258,000 of first and refunding mortgage bonds.

The commission has authorized the company to extend from June 1, 1934, to June 1, 1939, the maturity of \$2,155,000 Milwaukee & Northern first mortgage bonds and the maturity of \$5,092,000 Milwaukee & Northern consolidated mortgage bonds and to assume obligation and liability in respect of the principal and interest on the bonds.

CENTRAL R. R. OF NEW JERSEY.—*Annual Report.*—The annual report of this company for 1933, shows net deficit, after interest and other charges, of \$2,309,738, as compared with net deficit of \$1,828,083 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
Average Mileage Operated RAILWAY OPERATING REVENUES	689.89	691.99	-2.10
	\$27,401,329	\$30,357,469	-\$2,956,139
Maintenance of way	1,825,578	2,306,481	-480,903
Maintenance of equipment	5,098,950	5,768,363	-669,413
Transportation—Rail	10,825,194	12,030,919	-1,205,725
TOTAL OPERATING EXPENSES	19,648,591	22,182,692	-2,534,100
Operating ratio	71.71	73.07	-1.36
NET REVENUE FROM OPERATIONS	7,752,738	8,174,777	-422,039
Railway tax accruals	4,500,328	4,857,581	-357,253
Hire of equipment	910,733	689,472	+221,261
Joint facility rents	84,503	110,487	-25,984
NET RAILWAY OPERATING INCOME	2,253,768	2,507,298	-253,530
Non-operating income	1,196,203	1,594,104	-397,901
GROSS INCOME	3,449,971	4,101,402	-651,431
Rent for leased roads	2,384,794	2,379,907	+4,887
Interest on funded debt	2,648,877	2,702,554	-53,677
TOTAL DEDUCTIONS FROM GROSS INCOME	5,759,710	5,929,485	-169,775
NET INCOME	*\$2,309,738	*\$1,828,083	-\$481,655

* Deficit.

CLEVELAND UNION TERMINALS.—*Special Committee Finds No Economy In Joint Use.*—A special committee appointed by the Eastern Regional Co-ordinating Committee at the request of Co-ordinator Eastman to study the question of the joint use of the Cleveland union terminal facilities by the Baltimore & Ohio, Erie, Pennsylvania, and Wheeling & Lake Erie, has submitted a report, which has been approved by the Regional Co-ordinating Committee, finding that joint use of the terminal by these roads would not be economically justified. The committee found that service to the traveling public would be somewhat improved, that the station facilities would be adequate and that the use of the facilities by the additional roads would be physically practicable, but that this would require an additional capital investment by the other roads and the terminal company of \$1,693,000 and that there would be an increase of \$58,100 in operating charges. With an increase of \$135,500 in carrying charges this would make the total increase in cost \$193,600. The subject has not been stricken from the docket because there is a possibility that further negotiations may lead to more use of the terminal and the Baltimore & Ohio now has under arbitration the question of using the union terminal.

DELAWARE & HUDSON R. R. CORP.—*Annual Report.*—The annual report of this road for 1933 shows net deficit, after inter-

est and other charges of \$3,699,772, as compared with net deficit of \$4,477,591 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
Average Mileage Operated RAILWAY OPERATING REVENUES	864.68	864.70	-.02
	\$22,205,142	\$23,255,774	-\$1,050,632
TOTAL OPERATING EXPENSES	20,367,287	22,361,427	-1,994,140
NET REVENUE FROM OPERATIONS	1,837,855	894,347	+943,508
Railway tax accruals	947,335	957,379	-10,044
Railway operating income	2,267,375	1,267,840	+999,535
Hire of freight cars—Cr.	158,451	90,136	+68,315
Joint facility rents—Dr.	173,994	168,860	+5,134
NET RAILWAY OPERATING INCOME	952,025	* 67,043	+1,019,068
Non-operating income	221,015	232,759	-11,743
GROSS INCOME	1,173,041	165,716	+1,007,325
Rent for leased roads	1,819,489	1,759,038	+60,451
Interest on funded debt	2,868,879	2,634,802	+234,076
TOTAL DEDUCTIONS FROM GROSS INCOME	4,872,812	4,643,307	+229,505
NET INCOME—Deficit	\$3,699,772	\$4,477,591	-\$777,820

* Deficit.

ELGIN, JOLIET & EASTERN.—*Annual Report.*—The 1933 annual report of this company shows net deficit, after interest and other charges, of \$532,148, compared with net deficit of \$2,441,907 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
RAILWAY OPERATING REVENUES	\$9,985,608	\$7,764,089	+\$2,221,519
Maintenance of way	967,636	962,703	+4,933
Maintenance of equipment	2,267,904	1,870,097	+397,807
Transportation	3,677,287	3,539,587	+137,700
TOTAL OPERATING EXPENSES	7,563,736	7,173,469	+390,267
Operating ratio	75.75	92.39	-16.64
Railway tax accruals	1,001,588	1,195,154	-193,566
Railway operating income	1,419,870	*606,380	+2,026,250
Equipment and Joint facility rents—Net Dr.	491,482	410,467	+81,014
NET RAILWAY OPERATING INCOME	928,388	*1,016,847	+1,945,235
Non-operating income	101,406	136,958	-35,552
GROSS INCOME	1,029,793	*879,889	+1,909,683
Rent for leased roads	948,818	937,227	+11,591
NET INCOME	*\$532,148	*\$2,441,907	+\$1,909,758

* Deficit.

GULF, MOBILE & NORTHERN.—*Annual Report.*—The 1933 annual report of this road shows surplus, after interest and other charges, of \$75,152, compared with

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Design the Arch soundly; apply it properly and service it carefully.

Then back up this good work with good Arch Brick and you get Arch satisfaction.

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IRONTON FIRE BRICK CO.
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Colorado

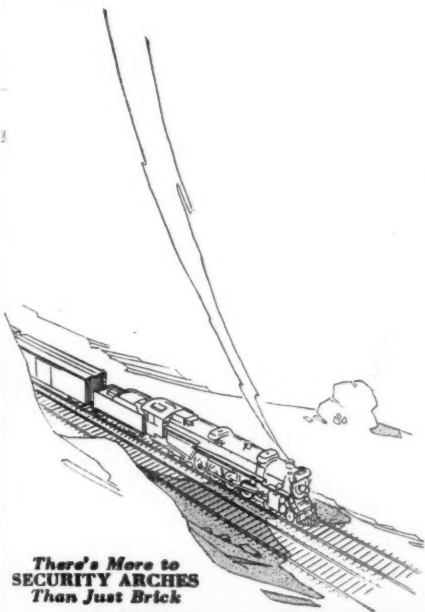
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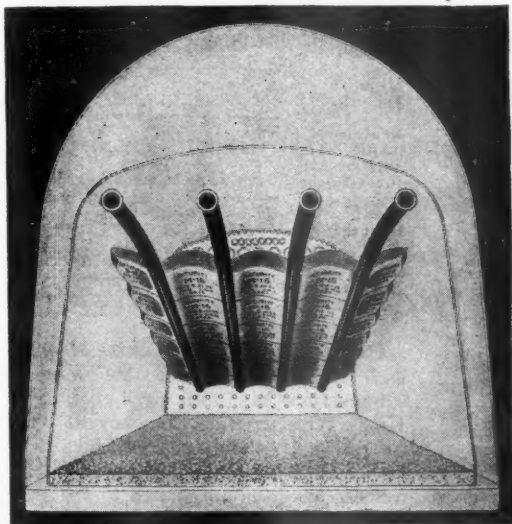
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*There's More to
SECURITY ARCHES
Than Just Brick*



AMERICAN ARCH COMPANY

INCORPORATED

Locomotive Combustion Specialists

NEW YORK

CHICAGO

a surplus of \$705,094 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
Average Mileage Operated	845.33	864.90	-19.57
RAILWAY OPERATING REVENUES	\$4,192,583	\$3,961,959	+\$230,624
Maintenance of way	474,849	545,635	-70,786
Maintenance of equipment	600,711	775,741	-175,030
Transportation	1,274,915	1,426,255	-151,340
TOTAL OPERATING EXPENSES	2,862,929	3,343,337	-480,408
Operating ratio	68.29	88.44	20.15
NET REVENUE FROM OPERATIONS	1,329,654	618,622	+711,032
Railway tax accruals	306,000	305,460	+540
Equipment rents—Net	187,562	124,941	-62,621
Joint facility rents—Net	197,975	239,331	+41,356
NET RAILWAY OPERATING INCOME	637,369	51,565	+688,935
Non-operating income	122,727	127,451	-4,724
GROSS INCOME	760,097	75,886	+684,211
Rent for leased roads	131,700	21,615	+110,085
Interest on funded debt	529,481	741,632	-212,151
TOTAL DEDUCTIONS FROM GROSS INCOME	684,945	780,980	-96,035
SURPLUS	\$75,152	\$705,094	+\$780,246

ILLINOIS CENTRAL.—R. F. C. Loan.—Division 4 of the Interstate Commerce Commission has issued a report approving a loan of \$7,500,000 from the Reconstruction Finance Corporation, on the company's application for a loan of \$10,000,000, on the condition, among others, that before any advance on the loan is made the company shall deposit with the corporation satisfactory evidence that the holders of substantially all of the \$20,000,000 of three-year 4½ per cent notes maturing June 1 will extend 62½ per cent of the principal for a term not less than that of the three-year loan. The company had originally asked for a loan of \$15,000,000 of which \$10,000,000 was to be used to pay one-half of the notes, but later amended the application. It asserted that its only available collateral was pledged with the R. F. C. and therefore that it could seek aid only from that corporation at this time. It also represented that unless the \$10,000,000 loan was obtained, it would endeavor to conserve cash to pay one-half of the principal of the notes by reducing its maintenance and other expenses as much as possible to make up the difference. The division finds that the security offered for the loan does not provide adequate support for an additional loan of \$10,000,000 and is not convinced that such necessity exists for the payment of one-half of this maturity that the applicant is warranted in adopting a program of further reduction of maintenance and employment to accomplish that end.

KANSAS CITY SOUTHERN.—Voting validity of shares.—A. P. Evarts and 11 other members of the firm, Paine, Weber & Co., New York and Boston, brokers, filed suit in the United States district court at Kansas City, Mo., on April 5, petitioning Judge Albert L. Reeves to appoint a special master to sit in a meeting of the board of directors of the railroad on May

8. The plaintiffs seek an opinion on the validity of 87,870 common shares of the road recently transferred to them for the Chicago Great Western, contrary to a ruling of the Missouri Public Service Commission. Officers of the road have refused to allow the shares to be voted.

KANSAS CITY SOUTHERN.—Annual Report.—The annual report of this company for 1933 shows net deficit, after interest and other charges, of \$1,244,546, compared with a net deficit of \$1,380,759 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
Average Mileage Operated	882.81	882.81	.....
RAILWAY OPERATING REVENUES	\$9,362,763	\$9,875,437	-\$512,674
Maintenance of way	951,115	1,019,372	-68,257
Maintenance of equipment	1,639,524	1,642,731	-3,207
Transportation	2,872,491	3,246,758	-374,267
TOTAL OPERATING EXPENSES	6,840,697	7,411,816	-571,119
Operating ratio	83.03	85.41	-2.38
NET REVENUE FROM OPERATIONS	2,522,065	2,463,621	+58,444
Railway tax accruals	933,440	1,023,125	-89,685
Railway operating income	1,586,111	1,437,671	+148,440
Equipment rents—Net Dr.	345,255	403,109	-57,854
Joint facility rents—Net Dr.	79,182	76,629	+2,553
NET RAILWAY OPERATING INCOME	1,161,674	957,933	+203,741
Non-operating income	719,430	931,454	-212,024
GROSS INCOME	2,305,541	2,369,124	-63,583
Rent for leased roads	168,962	166,367	+2,595
Interest on funded debt	2,690,101	2,700,420	-10,319
TOTAL DEDUCTIONS FROM GROSS INCOME	3,550,087	3,749,883	-199,796
NET DEFICIT	\$1,244,546	\$1,380,759	-\$136,213

LEHIGH & NEW ENGLAND.—Annual Report.—The 1933 annual report of this company shows net income, after interest and other charges, of \$300,338, as compared with net income of \$432,041 in 1932. Selected items from the Income Statement follow:

	1933	1932	Increase or Decrease
RAILWAY OPERATING REVENUES	\$3,000,725	\$3,274,739	-\$274,014
Maintenance of way	358,381	404,837	-46,456
Maintenance of equipment	635,581	684,212	-48,631
Transportation	1,064,709	1,122,662	-57,953
TOTAL OPERATING EXPENSES	2,300,107	2,480,537	-180,430
Operating ratio	76.65	75.75	+0.90
NET REVENUE FROM OPERATIONS	700,618	794,202	-93,584
Railway tax accruals	87,364	48,565	+38,799
Railway operating income	613,144	745,628	-132,484
Hire of freight cars—Cr.	175,509	196,528	-21,019
Joint facility rents	88,688	96,643	-7,955
NET RAILWAY OPERATING INCOME	702,257	848,845	-146,588
Non-operating income	28,532	23,824	+4,707
GROSS INCOME	730,789	872,670	-141,881

Interest on funded debt	402,869	407,504	-4,635
TOTAL DEDUCTIONS FROM GROSS INCOME	430,451	440,629	-10,178
NET INCOME	\$300,338	\$432,041	-\$131,703

NORFOLK & WESTERN.—Annual Report. The 1933 annual report of this company shows net income, after interest and other charges, of \$22,301,140, compared with \$16,811,918 in 1932. Selected items from the income statement follow:

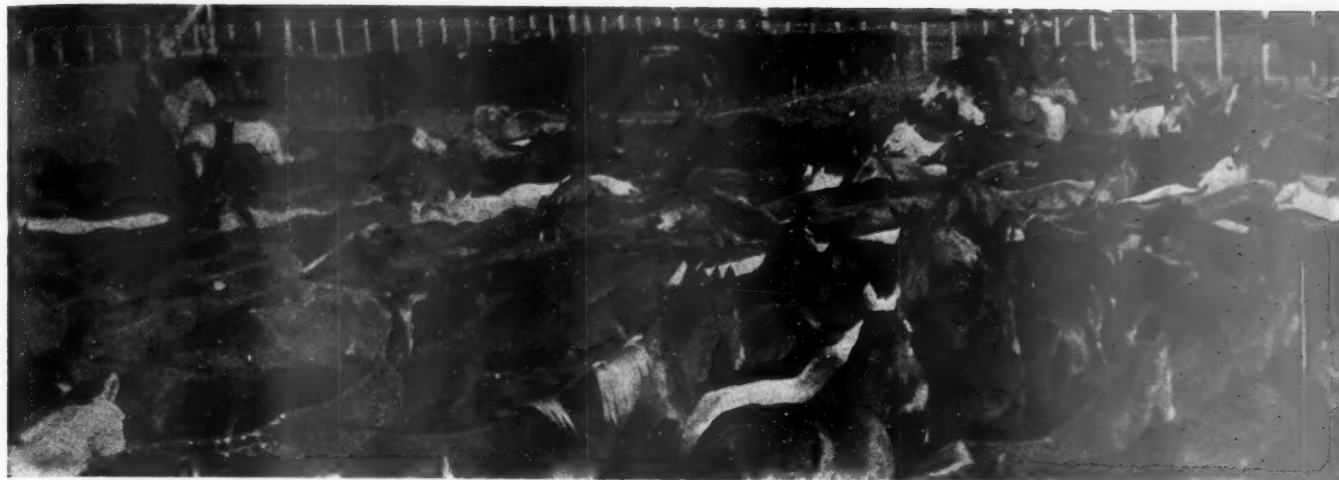
	1933	1932	Increase or Decrease
RAILWAY OPERATING REVENUES	\$69,262,891	\$62,775,611	+\$6,487,280
Maintenance of way	6,243,603	6,495,838	-252,235
Maintenance of equipment	13,483,654	11,136,166	+2,347,488
Transportation	15,335,719	15,831,447	-495,728
TOTAL OPERATING EXPENSES	39,017,307	37,745,533	+1,271,775
Operating ratio	56.33	60.13	-3.80
NET REVENUE FROM OPERATIONS	30,245,584	25,030,078	+5,215,505
Railway tax accruals	7,340,000	7,200,000	+140,000
Railway operating income	22,900,255	17,815,310	+5,084,946
Net Equipment and joint facility rents—Cr.	1,756,099	1,345,788	+410,311
NET RAILWAY OPERATING INCOME	24,656,354	19,161,098	+5,495,257
Non-operating income	1,963,993	2,203,960	-239,967
GROSS INCOME	26,620,347	21,365,058	+5,255,290
Rent for leased roads	101,004	100,979	+24
Interest on funded debt	3,892,785	4,116,630	-223,845
TOTAL DEDUCTIONS FROM GROSS INCOME	4,319,207	4,553,139	-233,932
NET INCOME	\$22,301,140	\$16,811,918	+\$5,489,222

OREGON & NORTHWESTERN.—Acquisition and Stock.—The Interstate Commerce Commission has authorized the Edward Hines Western Pine Company to abandon its railroad extending from Burns, Ore., to Seneca, 48 miles. The Oregon & Northwestern has been authorized to acquire and operate the line, and, in addition, about two miles of main line track now operated by the Hines company as a plant facility. The new company has been authorized to issue \$600,000 of common stock in payment for the railroad and equipment which it has acquired from the lumber company.

PENNSYLVANIA.—Annual Report.—The 1933 annual report of the P. R. R. shows net income, after interest and other charges, of \$19,281,169, an increase of \$5,707,633 over 1932. Selected items from the income statement follow:

	1933	Increase or Decrease
Average Mileage Operated	10,511.45	-381.01
RAILWAY OPERATING REVENUES	\$324,715,814	-\$6,677,644

Continued on next left-hand page



More Horses in the Same Corral

No arguments are needed to convince you that superheaters should be specified . . . superheaters are just as much a part of the steam locomotive as the boiler.

But as locomotives have been improved to meet changed conditions, so also have Elesco superheaters been developed to keep abreast with the demands of modern operation. It is of utmost importance, therefore, that you specify the superheater arrangement which

will give the maximum horsepower obtainable within the limits of the boiler . . . you want "more horses in the same corral."

These requirements are met by the improved small-tube type superheater, the Elesco type "E". It increases true boiler efficiency, it makes possible increased evaporating surface, and yet it gives the best possible ratio of superheating to boiler evaporating surface . . . which result in 25 per cent increase in the sustained horsepower.

For the modern super steam locomotives, or existing locomotives lacking in boiler horsepower —

Specify Elesco Type "E" Superheaters.



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Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheated Steam Pyrometers - American Throttles

Maintenance of way	26,370,632	-86,871
Maintenance of equipment	62,853,659	-2,420,949
Transportation	113,132,735	-9,516,108
TOTAL OPERATING EXPENSES	226,768,347	-15,243,256
Operating ratio	69.6	-3.0
NET REVENUE FROM OPERATIONS	97,947,466	+8,565,612
Railway tax accruals	24,459,599	-3,771,831
Railway operating income	73,367,416	+12,292,218
Hire of equipment—Dr.	9,634,386	-986,307
Joint facility rents—Dr.	1,756,171	+433,704
NET RAILWAY OPERATING INCOME	61,976,859	+12,844,820
Non-operating income	41,619,599	-4,979,792
GROSS INCOME	103,596,458	-4,979,792
Rent for leased roads	51,915,454	+776,781
Interest on funded debt	28,268,140	-141,359
TOTAL DEDUCTIONS FROM GROSS INCOME	84,315,289	+2,157,395
NET INCOME	\$19,281,169	+\$5,707,633

RUTLAND.—*Annual Report.*—The annual report of this company for 1933, shows net deficit, after interest and other charges, of \$70,328, as compared with a net deficit of \$41,460 in 1932. Selected items from the income statement follow:

	1933	1932	Increase or Decrease
RAILWAY OPERATING REVENUES	\$3,386,806	\$3,870,106	-\$483,300
Maintenance of way	565,563	679,219	-113,656
Maintenance of equipment	668,039	778,080	-110,041
Transportation	1,511,682	1,638,223	-126,541
TOTAL OPERATING EXPENSES	3,026,254	3,363,500	-337,246
Operating ratio	89.35	86.91	+2.44
NET REVENUE FROM OPERATIONS	360,552	506,605	-146,054
Railway tax accruals	237,470	248,067	-10,597
Railway operating income	122,775	257,754	-134,979
Equipment rents—Net	35,729	19,068	+16,661
Joint facility rents—Net	128,245	29,889	+98,357
NET RAILWAY OPERATING INCOME	286,750	306,711	-19,962
Non-operating income	68,359	86,500	-18,141
GROSS INCOME	355,108	393,212	-38,103
Rent for leased roads	19,000	19,000	
Interest on funded debt	403,741	406,491	-2,750
TOTAL DEDUCTIONS FROM GROSS INCOME	425,437	434,671	-9,235
NET DEFICIT	70,328	41,460	+28,868

Average Prices of Stocks and of Bonds

	Apr. 10	Last week	Last year
Average price of 20 representative railway stocks..	47.73	46.34	24.21
Average price of 20 representative railway bonds..	79.66	78.33	53.34

Dividends Declared

Carolina, Clinchfield & Ohio.—\$1.00, quarterly; Stamped Certificates, \$1.25, quarterly, both payable April 20 to holders of record April 10.
 Lehigh & Wilkes Barre.—\$2.00, quarterly, payable April 21 to holders of record April 12.
 Northern R. R. of New Hampshire.—\$1.50, quarterly, payable April 30 to holders of record April 6.
 Piedmont & Northern.—75c, quarterly, payable July 10 to holders of record June 30.
 Syracuse, Binghamton & New York.—3 per cent, quarterly, payable May 1 to holders of record April 21.
 Virginian.—Preferred, \$1.50, quarterly, payable May 1 to holders of record April 14.

Railway Officers

EXECUTIVE

P. H. Van Hoven, assistant to the president of the Duluth, Missabe & Northern, has been elected vice-president with headquarters as before at Duluth, Minn.

J. A. Streyer, vice-president in charge of traffic of the American Short Line Railroad Association, with headquarters at Atlanta, Ga., resigned from that position on March 31.

Matthew S. Sloan, who was formerly president of the New York Edison Company and who has been a member of the board of directors of the Missouri-Kansas-Texas for the past year, was on April 11 elected to the chairmanship of the board of the M-K-T, succeeding **M. H. Cahill**, who has resigned both the chairmanship and the presidency, this latter post to remain, for the time being, unfilled.

William Walliser, whose retirement as vice-president in charge of personnel of the Chicago & North Western was noted in the *Railway Age* of April 7, was born on July 27, 1866, at West Chicago, Ill., and entered railway service in May, 1883, as an engine caretaker, being promoted to locomotive fireman in November of the same year. Two years later Mr. Walliser was made a freight brakeman and in 1892 he was advanced to freight conductor. After 10 years in the latter position he was further advanced to trainmaster on the Galena division, and in November, 1903, he was made assistant division superintendent. In March, 1909, Mr. Walliser was promoted to superintendent of the Minnesota division, being transferred to the East Iowa division in May, 1911. Three years later he was promoted to assistant to the general manager with headquarters at Chicago, continuing in this position until November, 1918, when he was promoted to assistant general manager with the same headquarters. In 1924 he was made vice-president in charge of personnel, at Chicago, which position he held until his retirement.

OPERATING

H. J. Main, superintendent of the Saskatoon division of the Canadian Pacific, with headquarters at Saskatoon, Sask., has been appointed acting general superintendent of the Manitoba district, with headquarters at Winnipeg, Man. **A. Halkett**, general superintendent of the Manitoba district, has been granted a leave of absence because of ill health. **J. L. Jamieson**, superintendent at Calgary, Alta., has been transferred to Saskatoon to succeed Mr. Main, and **W. Manson**, superintendent at Nelson, B. C., has been transferred to Calgary to replace Mr. Jamieson.

H. H. Meek, superintendent of organization for the Railway Express Agency, Inc., at Chicago, has been promoted to assistant to vice-president with the same headquarters, succeeding **Walter Reese**,

who has been appointed general manager at St. Paul, Minn. Mr. Reese succeeds **J. E. O'Neill**, who has been transferred to Seattle, Wash., where he replaces **E. M. Whittle**, who has been transferred to Los Angeles, Cal., to relieve **J. F. Baker**, who has retired.

Mr. Baker was born on February 9, 1870, at Austin, Nev., and entered the service of the Wells Fargo Express Company at Austin in 1886, being sent to Portland, Ore., two years later where he served in various clerical and supervisory positions. From 1903 to 1911 he served as route agent and general agent at Oakland, Cal., being appointed superintendent at Los Angeles, Cal., in the latter year. In 1913 Mr. Baker was made efficiency superintendent with headquarters at San Francisco, Cal., and in 1916 he returned to Los Angeles as general superintendent. Two years later he was appointed general manager for the American Railway Express Company at Los Angeles and continued in this position when this company was succeeded by the Railway Express Agency, Inc., in 1929.

PURCHASES AND STORES

T. W. Durham has been appointed purchasing agent of the Lake Superior & Ishpeming, with headquarters at Marquette, Mich., succeeding **A. J. Yungbluth**.

C. E. Walsh, purchasing agent of the Pennsylvania, with headquarters at Philadelphia, Pa., has been promoted to general purchasing agent, effective April 16. **E. J. Lamneck**, fuel purchasing agent, with headquarters in Philadelphia, will succeed Mr. Walsh. **P. A. Hollar**, coal agent, will replace Mr. Lamneck as fuel purchasing agent at that point.

TRAFFIC

J. B. Blanton has been appointed assistant traffic manager of the Litchfield & Madison, with headquarters at Tulsa, Okla.

A. A. Price, city freight and passenger agent at Washington, D. C., for the Southern Pacific, has had his title changed to general agent.

O. L. Strieby, general agent for the Missouri Pacific at Pueblo, Colo., has been promoted to the newly-created position of assistant general freight and passenger agent at the same point.

E. J. Sexton, assistant traffic manager of the Minneapolis, Northfield & Southern and the Minnesota Western, has been promoted to traffic manager, with headquarters as before at Minneapolis, Minn.

E. D. Forde and **W. J. Mitchell**, traffic representatives for the Missouri-Illinois at Pittsburgh, Pa., and Chicago, respectively, have had their titles changed to general agent.

W. P. Withers, commercial agent for the Illinois Central at Tulsa, Okla., has been appointed to the newly-created position of general southwestern agent, with headquarters at Dallas, Tex. **W. C. Berg** has been appointed general perishable freight agent at Chicago to succeed **C. L.**

Continued on next left-hand page

Netherland, who has been appointed general agent at Milwaukee, Wis. **W. D. Cook**, assistant general freight agent at Chicago, has been transferred to Atlanta, Ga.

J. H. Brinkerhoff, general agent, freight department, for the Northern Pacific at Chicago, has been appointed to the newly-created position of assistant freight traffic manager with the same headquarters.

B. E. Thomas, assistant general freight agent on the St. Louis-San Francisco, at St. Louis, Mo., has been promoted to the newly-created position of assistant freight traffic manager with the same headquarters.

Thomas L. Manning, traveling freight agent for the Chicago, Rock Island & Pacific, with headquarters at Indianapolis, Ind., has been promoted to general agent with the same headquarters, succeeding **R. L. Ward**, deceased.

R. P. Sohan, general freight and passenger agent of the Frankfort & Cincinnati, has been appointed to the newly-created position of general traffic manager, with headquarters as before at Frankfort, Ky. The position of general freight and passenger agent has been abolished.

C. W. Haynes, district passenger agent for the Chesapeake & Ohio, with headquarters at Chicago, has been assigned temporarily as special representative of the passenger department in which capacity he will visit the various ticket offices with a view to developing a higher standard of salesmanship.

S. H. Gillette, assistant general freight agent on the Chicago & North Western, has been promoted to the newly-created position of general freight agent in charge of divisions, with headquarters as before at Chicago. **Ernest G. Johnson**, commerce assistant, has been promoted to assistant general freight agent at Chicago to succeed **William H. Jones**, who has retired.

W. H. Millard, general agent at Pittsburgh, Pa., for the Northern Pacific, has been promoted to eastern freight traffic manager, with headquarters at New York City, succeeding **T. B. Montgomery**, who has resigned. **Clifford T. Penn**, traveling passenger agent at Pittsburgh, has been promoted to general agent, passenger department, with the same headquarters, while **Arthur N. Gustafson**, commercial agent at Chicago, has been advanced to general agent, freight department, with headquarters at Pittsburgh.

C. F. Snyder, eastern passenger agent at New York for the Missouri-Kansas-Texas, has had his title changed to general eastern passenger agent. **R. B. Davis**, traveling freight agent at El Paso, Tex., **L. G. Bergman**, traffic representative at Winston-Salem, N. C., and **G. R. Reeder**, commercial agent at New Orleans, La., have all been appointed to the newly-created positions of general agent at their respective headquarters. **George S. Stein**, has been appointed to the newly-

created position of general agent, passenger department, at Cincinnati, Ohio.

As announced in the *Railway Age* of March 31, **Oscar W. Cox** has been appointed general traffic manager of the Norfolk & Western, with headquarters at Roanoke, Va., succeeding **G. F. Butler**.



Oscar W. Cox

F. H. Pitman has been appointed freight traffic manager at the same point, replacing Mr. Cox, and **Freeman W. Jones** has been appointed general freight agent in charge of solicitation, at Roanoke, succeeding Mr. Pitman. Mr. Cox was born at Olive Furnace, Ohio, on February 13, 1879. He entered the service of the Norfolk & Western as telegraph operator and ticket agent at Columbus, Ohio, in February, 1897. In December, 1899, he entered the freight traffic department at that point as telegraph operator and clerk, being given a regular clerkship in May, 1903. Mr. Cox was appointed soliciting freight agent in May, 1910, then being advanced successively in June of the same year he became coal agent to the positions of traveling freight agent, chief clerk and commercial agent at Toledo, Ohio. He was appointed division freight agent in January, 1922, and freight agent. Mr. Cox was appointed general coal freight agent in May, 1925, serv-



F. H. Pitman

ing in that capacity until February, 1927, when he was advanced to general freight agent. In June, 1931, Mr. Cox became freight traffic manager, the position he held at the time of his recent promotion.

Mr. Pitman was born in Roanoke on

April 10, 1888. He entered the service of the N. & W. in August, 1902, as a mimeographer in the freight traffic department. He served in various capacities in the filing, mailing and recording departments and later handled percentage, tariff, rate and quotation matters. In August, 1916, he became chief rate clerk and in March, 1920, he was further advanced to the position of chief clerk to the freight traffic manager. Mr. Pitman became division freight agent in June, 1922, serving in that position until February, 1927, when he became assistant general freight agent. He was appointed general freight agent in June, 1931.

Mr. Jones was born at Lawrenceville, Va., on October 7, 1876. He started his railway career with the Norfolk & Western as a clerk in the transportation department at Petersburg in July, 1899. He subsequently served at the same point as assistant ticket agent, ticket agent and assistant freight and passenger agent. He then served successively as commercial agent at Charlotte, N. C., service agent at Winston-Salem, N. C., traveling agent for the car record department, general agent at Richmond, Va., division freight agent at Win-



Freeman W. Jones

ston-Salem and general agent at Cincinnati, Ohio. Mr. Jones was promoted to assistant general freight agent at Columbus, Ohio, in February, 1927, the position he held until his recent promotion.

F. K. Prosser has been appointed coal traffic manager of the Norfolk & Western, with headquarters at Roanoke, Va., as reported in the *Railway Age* of March 31, and **L. P. Harrell** has been appointed to succeed him as manager of the coal department at that point. Mr. Prosser was born at Richmond, Va., on October 12, 1889. He was graduated from Virginia Polytechnic Institute with a B.S. degree in civil engineering in 1911, and a civil engineering degree in 1912. He also completed a special course in mining engineering. During the school vacations, Mr. Prosser worked for various coal companies in the Pocahontas coal field. After graduation, from October, 1912, until November, 1917, he served as engineer successively for the Clinchfield Coal Corporation at Slemp, Va., and for Thomas Peale. He then served first as consulting engineer at Indiana, Pa., and then as assistant to the chief engineer of the Clearfield Bituminous Coal Corp.



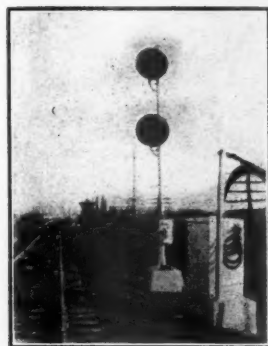
Crossing of Toledo Terminal R. R. at Gould, Looking N. E.



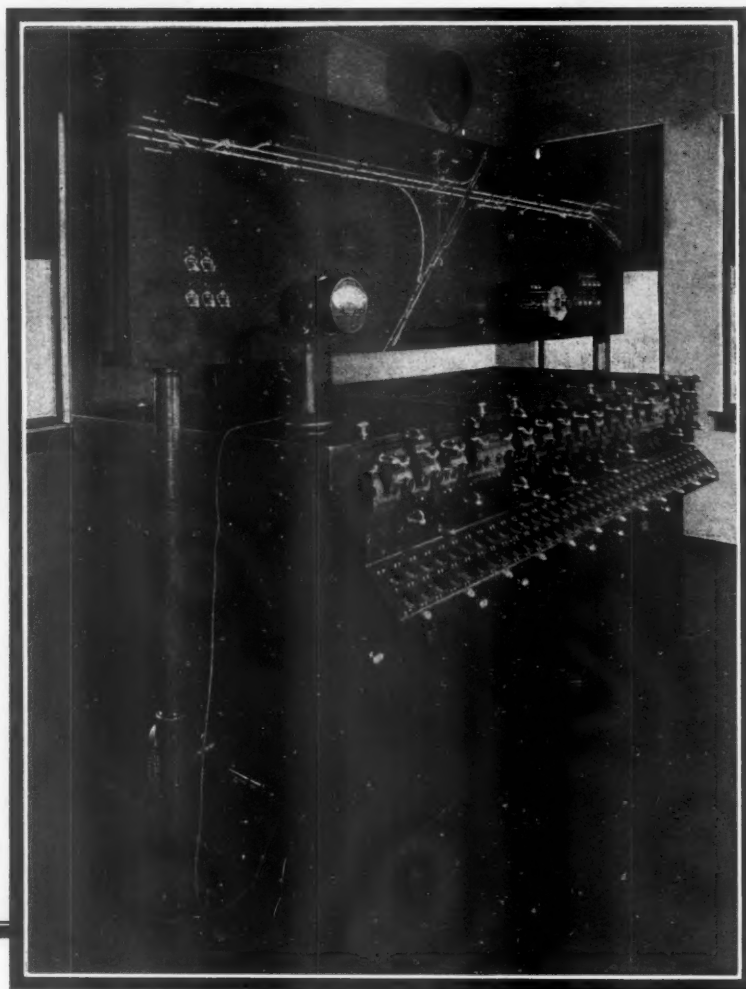
Tower and Crossing of the Toledo Terminal R. R. at Gould.



Style H-2 Drawf Searchlight Signal and Style M-2 Switch Movements.



N. B. Home Signal, Style H-2 Searchlight, at Gould Interlocking. Steel Relay Case.



Style H-2 Searchlight Signals Mounted on Cantilever Bridge at Maumee



A SIX MILE INTERLOCKING

Installation of "Union" Type "F" Electric Interlocking at Gould, Ohio, on the Nickel Plate provides for the operation of nearby and remote functions over six road miles. "Union" Type "F" Interlocking provides that operating flexibility so desirable. Safety, simplicity, re-

liability and economy are inherent characteristics. Multiple unit control from a single lever makes possible a small size machine requiring less tower space. Where electric interlocking is desired, the type "F" system meets all requirements. Consult nearest district office for details.

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During the World War Mr. Prosser served as a first lieutenant and later as captain of the 23rd U. S. Engineers. He later served as general superintendent of the Wisconsin Granite Company at Chi-



F. K. Prosser

cago and as special engineer for the Scranton Electric Construction Co. Mr. Prosser entered the service of the Norfolk & Western as a mine rating commissioner at Bluefield, W. Va., in November, 1922. With the creation of a new coal department in June, 1931, he was appointed manager of that department, in which position he served until his recent promotion.

Mr. Harrell was born at Colerain, N. C., on November 3, 1894. He was educated in high school in that state and at the North Carolina A. & M. College. He entered railway service with the Seaboard Air Line in 1911, serving consecutively as stenographer and secretary to the assistant freight traffic manager and to the general manager. After several months' service as assistant to commissioner, commission on car service of the American Railway Association, Mr. Harrell enlisted in the U. S. Army in 1917. After serving for 15 months in France, he was discharged in June, 1919, as a first lieutenant. Mr. Harrell entered the service of the Norfolk & Western in 1919. When



L. P. Harrell

the railroads were returned to private ownership in 1920, he was appointed secretary to the general superintendent of transportation, which position he held from August, 1920, until April, 1931. On the latter date he was appointed to special

work in the coal fields. In June, 1931, Mr. Harrell was promoted to chief clerk to the coal traffic manager and in March, 1933, he was further advanced to the position of assistant manager of the coal department, the position he held until his recent promotion.

E. L. Repass, assistant general passenger agent of the Norfolk & Western, with headquarters at Roanoke, Va., has been appointed general passenger agent, to fill the position which has been vacant since February 1, 1932, when **John L. Bladon**, who formerly held that position was appointed passenger traffic manager to succeed **W. C. Saunders** who retired at that time. The position of assistant general passenger agent formerly held by Mr. Repass has been abolished. Mr. Repass was born in Roanoke County on November 15, 1888 and entered the service of the Norfolk & Western as clerk in the office of the auditor of receipts in June, 1905. Two months later he was transferred to the office of the general passenger agent. He was appointed assistant ticket agent at the Roanoke passen-



E. L. Repass

ger station in October, 1906, and was further advanced to the position of ticket agent in September, 1909. He remained in the latter position until March, 1926, when he was promoted to chief clerk in the passenger traffic department. In February, 1932, Mr. Repass became assistant general passenger agent, the position he held at the time of his recent promotion.

MECHANICAL

J. J. Prendergast, assistant mechanical superintendent of the Texas & Pacific, has been appointed acting mechanical superintendent, with headquarters as before at Dallas, Tex.

G. C. Seidel has been appointed superintendent of motive power of the Missouri & North Arkansas, with headquarters at Harrison, Ark., succeeding **W. R. Meeder**.

MOTOR TRANSPORT

Paul W. Moyer, who has been appointed assistant superintendent of the Reading Transportation Company, with headquarters at Philadelphia, Pa., as reported in the *Railway Age* of March 24,

page 458, was born on March 2, 1902, at Catasauqua, Pa. He was educated at Mercersburg Academy, Bethlehem Preparatory school, and Pierce Business College, Philadelphia. Mr. Moyer began his career with the Reading in September, 1918, as clerk at



Paul W. Moyer

Catasauqua, and until September, 1925, served during school vacations as night clerk on the Reading division. In July, 1926, Mr. Moyer was appointed clerk to the superintendent of highway transportation of the Reading, continuing in that position until May, 1928, when he was appointed inspector for the Reading Transportation Company. He was further advanced to the position of supervisor of freight transportation for the latter company in February, 1932, the position he held at the time of his recent promotion.

OBITUARY

T. S. Stevens, signal engineer of the Atchison, Topeka and Santa Fe at Chicago, died on April 11 following a long illness.

John B. Nettle, freight traffic manager of the Pittsburgh & Lake Erie, with headquarters at Pittsburgh, Pa., died at his home in that city on April 7. Mr. Nettle was 63 years of age.

James T. Carey, who retired as general superintendent of the Norfolk & Western's Eastern general division nearly three years ago, died in Roanoke, Va., on April 6, at the age of 73. Mr. Carey began his railroad career with the Atlantic, Mississippi & Ohio as water boy in 1871 and later served with the same road as section laborer. In 1881, when this road was taken over by the Norfolk & Western, Mr. Carey was appointed section foreman, subsequently serving as engineer, road foreman of engines, assistant trainmaster, and trainmaster. In 1905 he was promoted to assistant superintendent of the Pocahontas division, serving in that position until 1907, when he was appointed superintendent of that division. He was transferred in the same capacity to the Scioto division in 1910. In January, 1918, Mr. Carey was appointed general superintendent in charge of the Western general division at Bluefield, W. Va., and in February, 1923, he was transferred to Roanoke as general superintendent of the Eastern general division, the position he held when he retired from active service in 1931.